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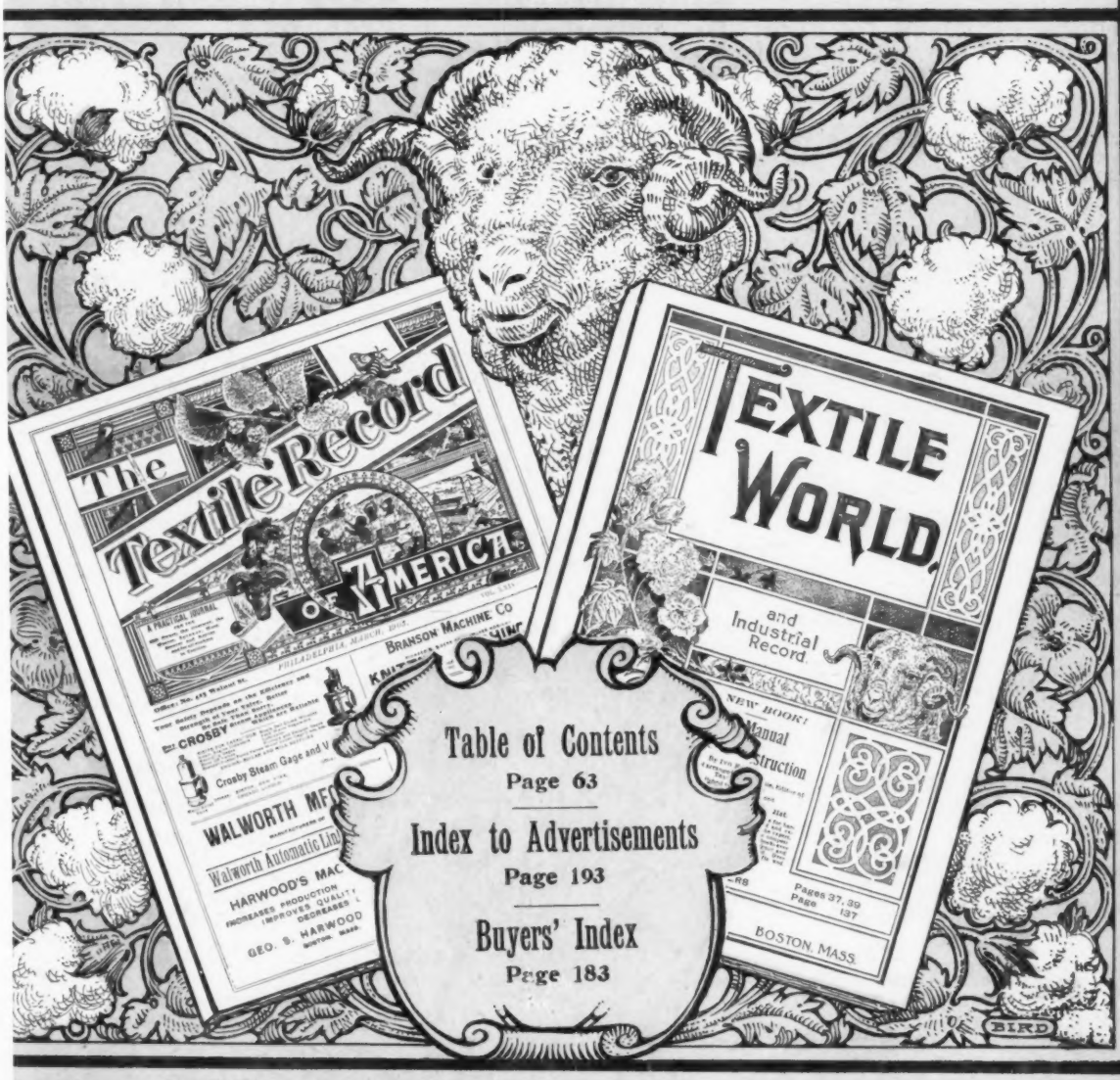

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The Textile-Finishing Machinery Co.

17 EXCHANGE PLACE, PROVIDENCE, R. I.

Mercerizing Machinery for Piece Goods and Yarn in the Warp or Chain

Singeing Machines,

Boiling Kiers,

Washers, Squeezers,

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Continuous Chainless

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Dyeing Machines,

Open Soapers,

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Color Kettles,

Horizontal or Vertical Drying Machines, with Copper or Tinned Iron Cylinders,

Automatic Tentering Machines,

Water and Starch Mangles,

Dampening Machines,

Dyeing Machines for Chain Warps.

BUILDERS OF ALL KINDS OF

MACHINERY

FOR

BLEACHING
DYEING
DRYING

AND

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Calenders for Rolling, Glazing, Chasing and Embossing, also Callenders for Moire Finish.

Sole Manufacturers of Patented Flexible Cloth Expander for Cylinder Drying Machines, Calenders, Mangles, &c.

Patent Combination Rolls Made of Cotton and Husk, especially adapted for Soft Finish, Unequalled for Elasticity and Durability.

Cotton, Paper, Husk, Chilled Iron, Brass and Rubber Rolls, Electro-deposited Copper Rolls for all Purposes.

Padding and Drying Machines for Shade Cloths.

Single and Double Cylinder Engines.

Hydraulic Presses and Pumps.

ALL KINDS OF OUTFITS FOR BLEACHING THREAD AND SOFT TWISTED YARN.
BLEACHING MACHINERY FOR YARNS IN THE WARP OR CHAIN.

Estimates, Drawings and full particulars of complete plants furnished on application

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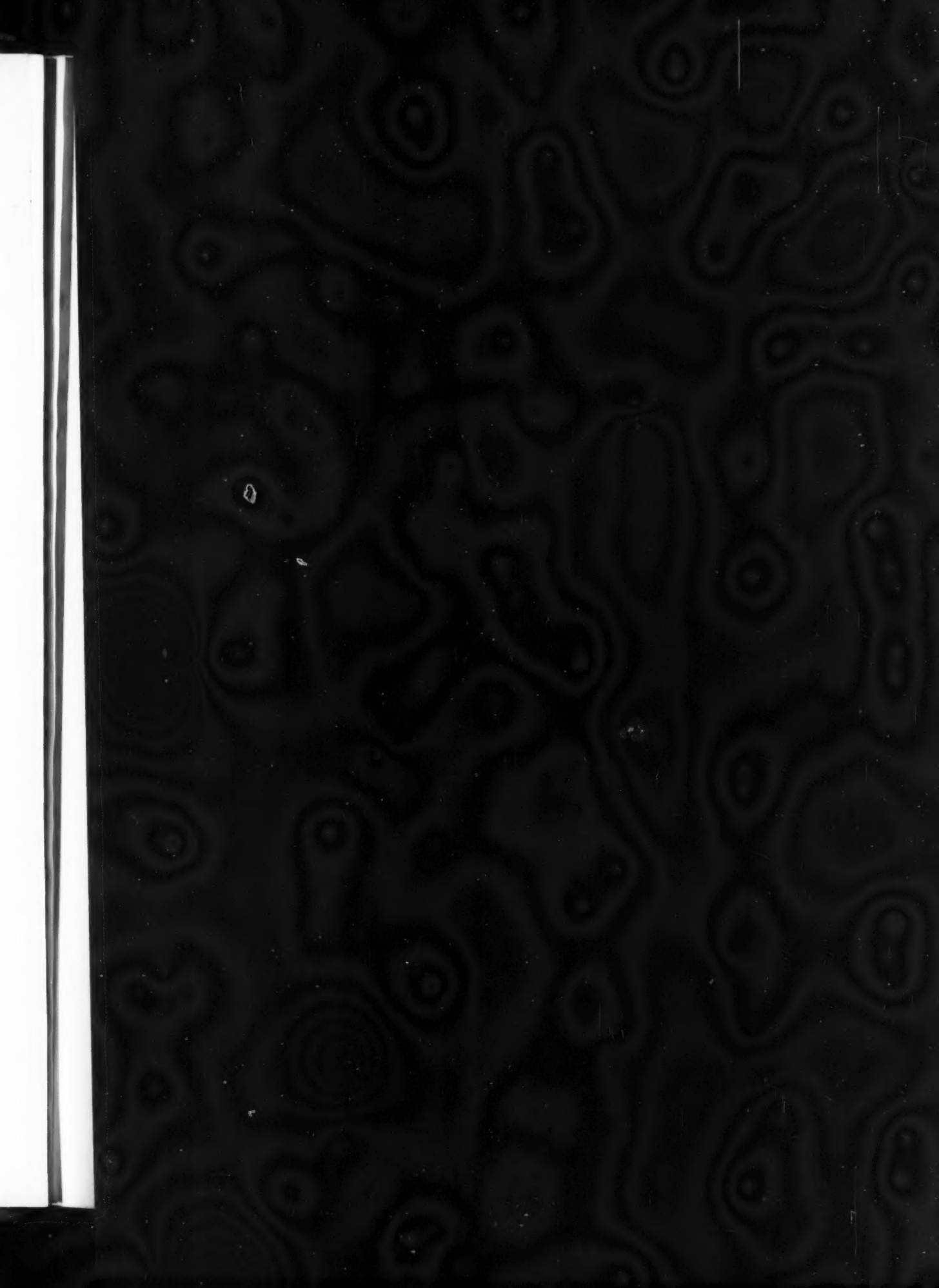

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OF

JACKSON & HUNT

Patented in the United States, Great Britain and the Continent
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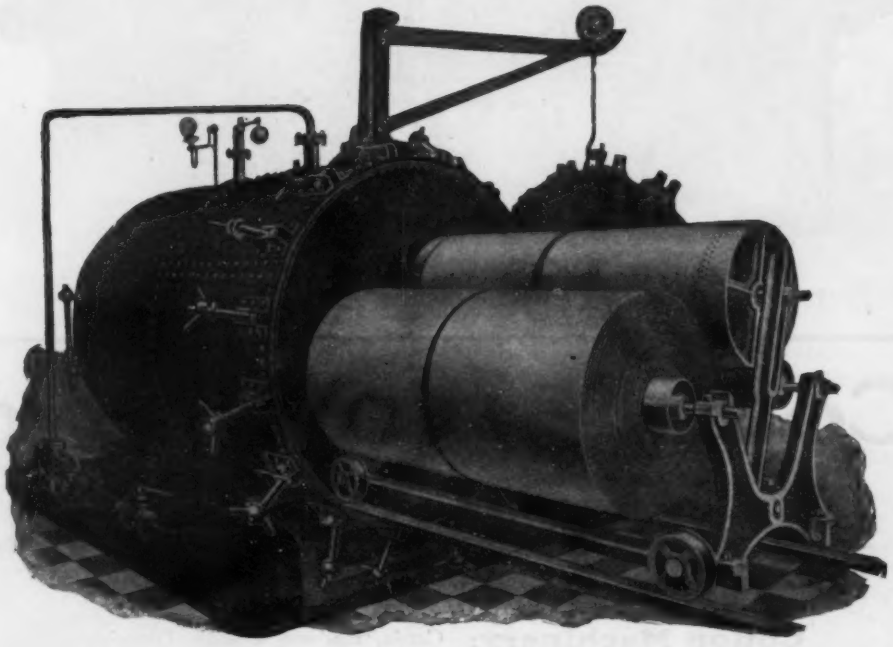

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Bleaching, Dyeing, Drying and Finishing Machinery

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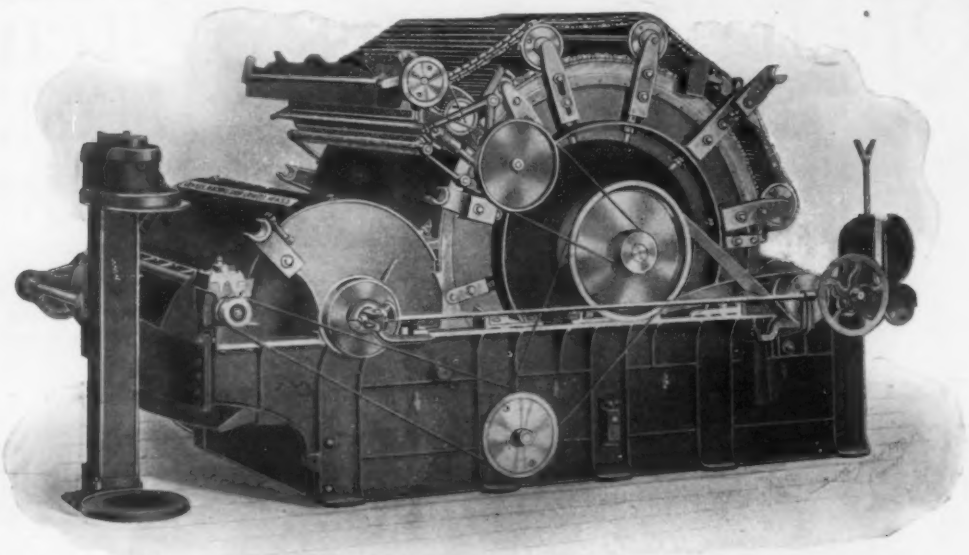

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With Modifications to Suit Any Class of Work.

Cotton Machinery: Cards, Railway Heads, Drawing Frames, Fly Frames, Speeders, Ring Spinning Frames, Twisters, Spoolers, Reels, Warpers, Slashers, Winders, Looms, Shearing Machines, Balling Machines, Folders, Stamping Machines, Sewing Machines, Size Pumps, Size Kettles, Drawing-in Frames, Baling Presses, Indigo Grinders.

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Plans, Specifications and Estimates furnished upon application.

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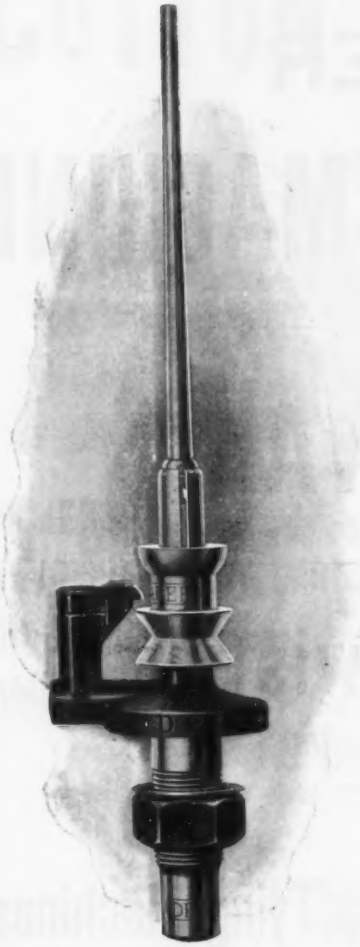
A New Spindle Improvement



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Fits the Bobbin loosely when at rest—allows considerable variation in fit.

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Allows easier and quicker doffing — stronger bobbins — less reaming.

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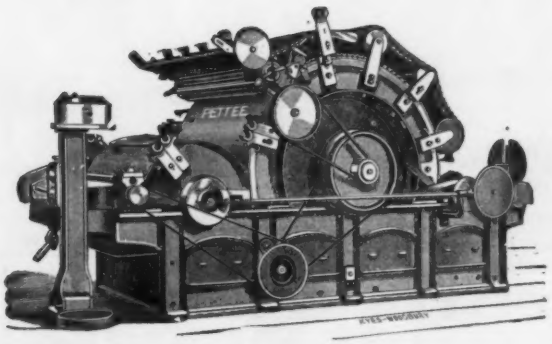

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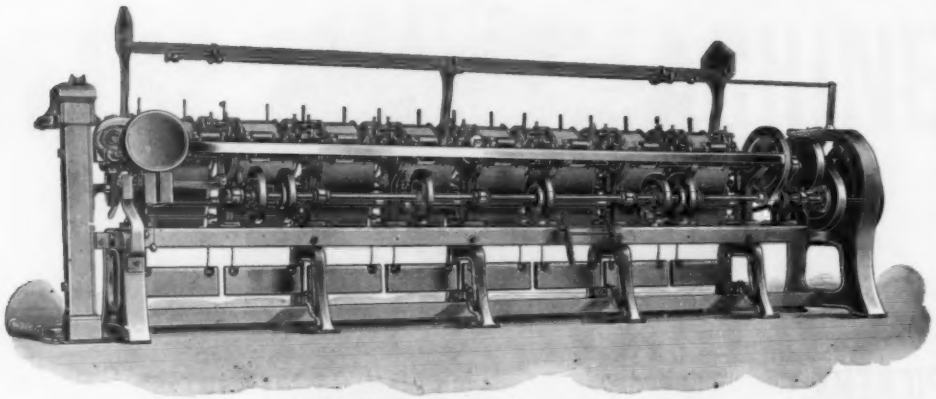

The Whitin 8 Head Comber.

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Spoolers,
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Reels,
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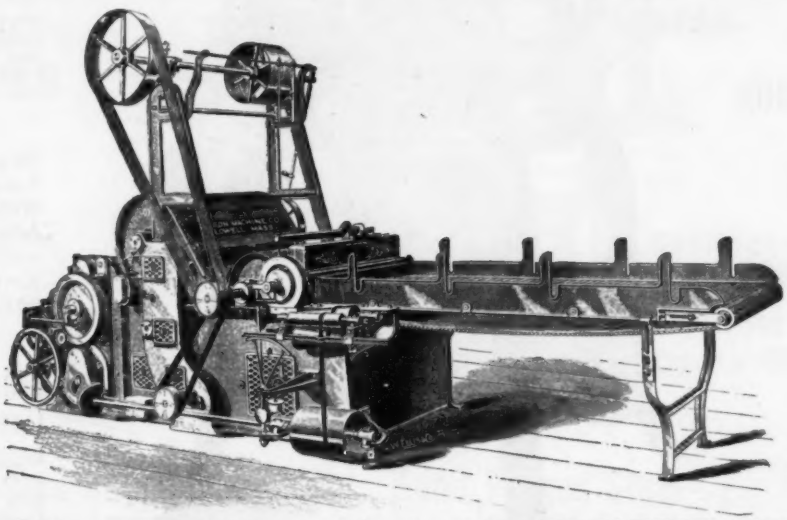
Long Chain Quilling Machines.

The Best Pickers

In the Cotton Field nothing equals the DARKY COTTON PICKERS.



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LARGEST BUILDERS OF COTTON OPENERS AND LAPPERS IN THE WORLD.

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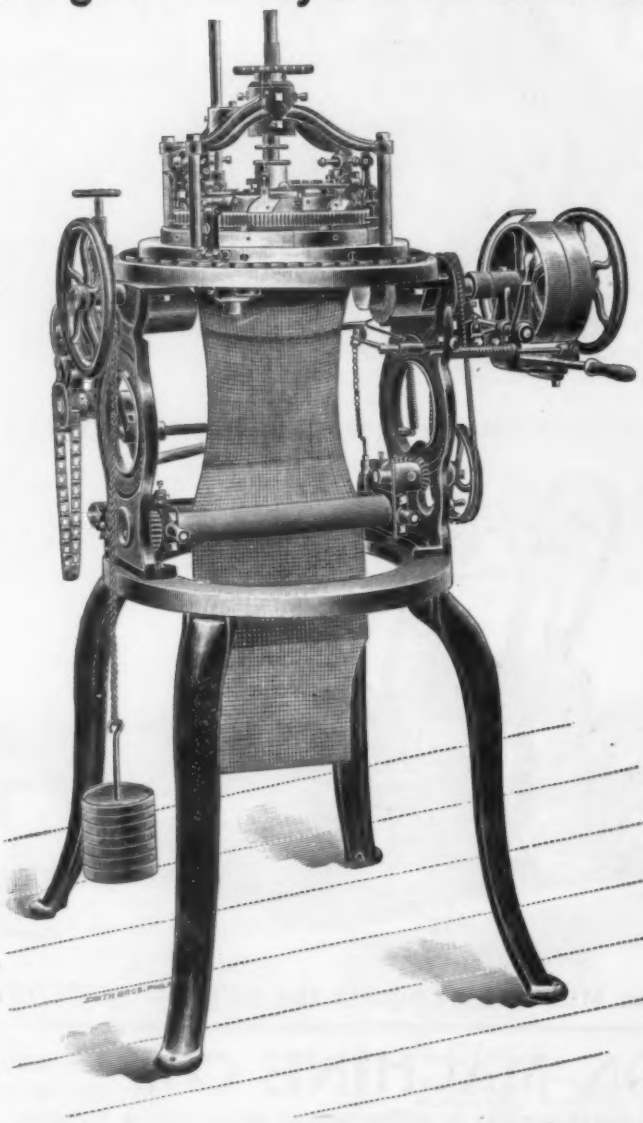
BUILDERS OF

Rib Knitting Machinery for Underwear and Hosiery

The illustration shows our

Improved High Speed Single Lever Automatic Ribbed Underwear Machine

for making ladies' and gents' ribbed underwear, union suits, etc., plain and shaped.



Plain, Single Lever or with Welt, Slack Course and Automatic Slackening Device for Welt.

Improved Measuring Device, by actual length knit.

Sizes. 8 to 24 inches, inclusive, varying by one inch.

Number of Feeds, four to 12, according to style and diameter of machine.

Solid Forged Steel Cylinders, specially hardened or with patent inserted walls for fine fabric.

Special Machinery for Sweaters etc.

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A Complete Line of Full Antomatic and 7-8 Automatic Seamless Hosiery Machinery.

Full Particulars, Samples and Special Catalogues on Application.

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Hand or Power, Open Top or Hold Down.
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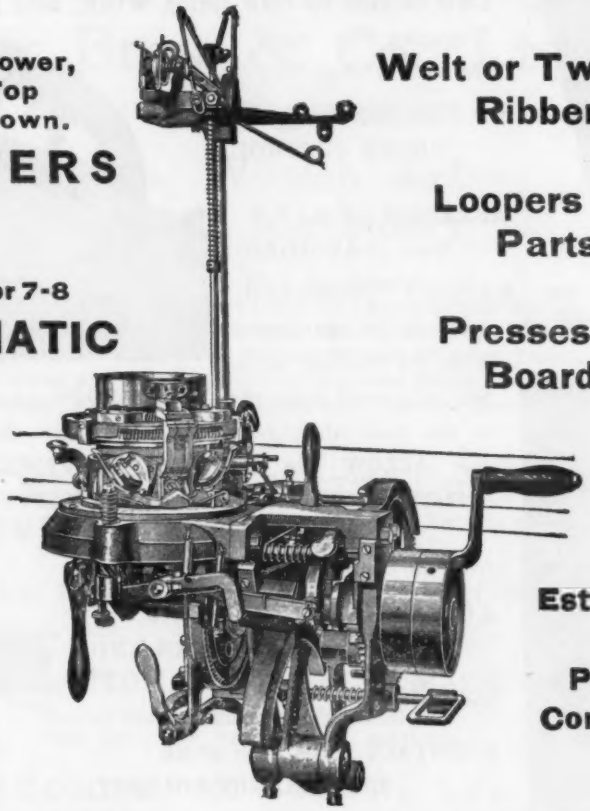
AUTOMATIC KNIT-TERS

All Sizes and All Gauges.



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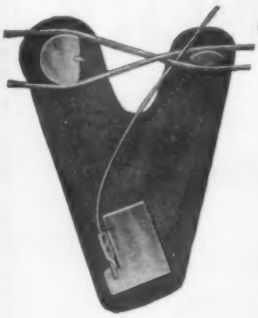
Absolute Efficiency from Bed-Rock Simplicity



Our **WARP-STOP** controls
TWO threads by ONE spring WIRE, held in a COMB,
engaging the warp
in such a way that
the TENSION is UNDER CONTROL,
and
ABRASION of the yarn is AVOIDED.

The COMBS are RAPIDLY INSERTED, BEFORE or AFTER the warp is in the loom, and are carried in a bar suspended from **the LEASE-RODS** which **ARE NOT FIXED** to the loom side, but **FREE to take their proper positions,** and **ALLOW the NATURAL MOVEMENT of the WARP,** so that **the COVER of the cloth is UNAFFECTED.**

When a thread breaks the WIRE SPRINGS OUT from the comb, thus giving
a CLEAR SIGNAL of the place of the BROKEN END,
and, by striking
a CONTACT SLIP upon which LINT CANNOT COLLECT,
closes the circuit through
a PERFECT KNOCK-OFF, EASILY and RAPIDLY FIXED, and **actuated by a SPARKLESS current.**

American Textile Appliances Co.

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BY FAR THE LARGEST MAKERS IN THE WORLD OF

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Platt's Cotton Comber will comb from 7-8″ stock to Sea Islands.
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Platt's Special Machinery for Making French Worsted Yarns.
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Looms for Worsteds, etc.

JOSEPH SYKES BROS., Card Clothing for Cotton.

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The Best French and English Combing and Rubbing Aprons.
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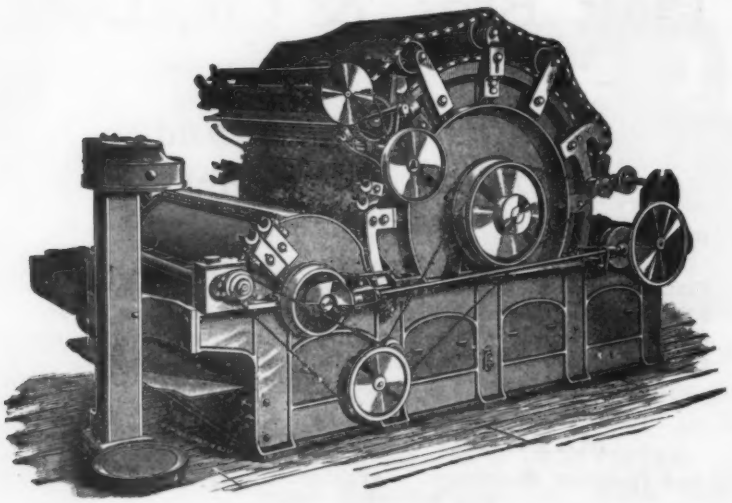

Cards, Combers, Railway Heads,
Drawing Frames, Spinning
Frames, Mules and
Looms,

INCLUDING

Plain and Fancy Silk Looms

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EASTON & BURNHAM MACHINE CO.

PAWTUCKET, R. I.

SPOOLING & WINDING MACHINERY

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NOT ONLY
THE LATEST
BUT ALSO THE
SIMPLEST and BEST.

THE CAMLESS WINDER.

For Cones and Tubes.

Send for Descriptive Circular.

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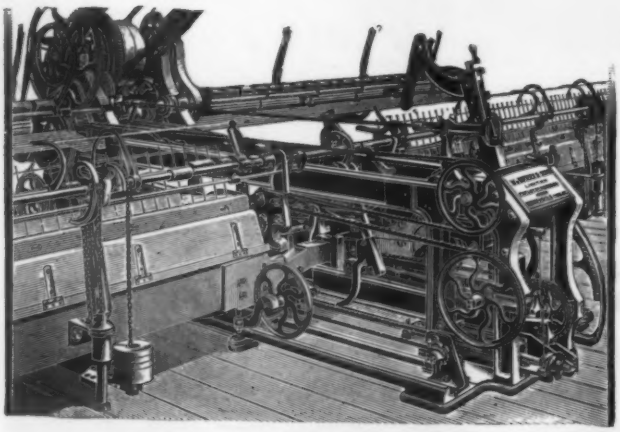

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Makers of all descriptions of Tentering and Drying Machines.

Moore & Whiteley's Patent Wool and Cotton Dryer.

Crabbing or Winding-on Frames.

Cross Raising Machines, Wool Scouring Machines,

Hydro Extractors. Warp Sizing.

Cool Air Drying and Beaming Machines.

Warping Mills with Patent Sectional Dividing Apparatus.

Self-Acting Mules. Bobbin or Pirn Winder, &c., &c.

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Second-hand Tentering Machines in good repair at low prices.

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For WOOL,
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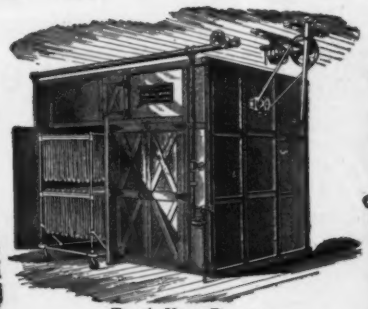
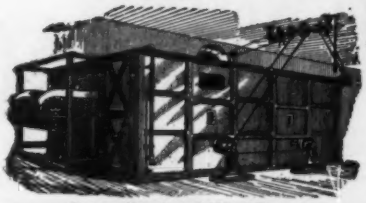


Truck Yarn Dryer.



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CARBONIZING,

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OXIDIZING, CHROMING and WASHING MACHINERY.

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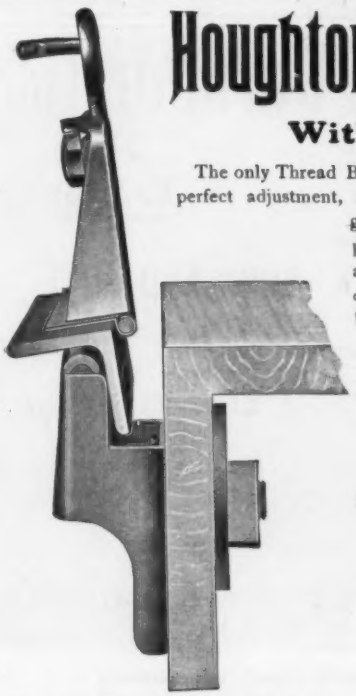

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With Hardened Thread Guides.

The only Thread Board that ***holds a guide solid*** all the time; ***never*** gets loose; is always in perfect adjustment, and thus must make a saving in travelers, broken ends, waste, thread guide, care and also prolong the wear of rings and increase the production per spindle. These claims are based on the truth of mechanical principles and have been proven true by actual use in many mills, whose superintendents will substantiate these claims. Write for list of mills using our Thread Boards.

PRICE.
Steel Thread Boards, 7½c. per Spindle
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Add 3c. each for Metal Rail.

1,000,000 Already in Use.

Thousands of wooden thread boards thrown aside and replaced with my Steel Boards because they pay for themselves annually.

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Nov. 30, . . .	1897	Nov. 9, . . .	1901
Mar. 8, . . .	1898	June 9, . . .	1903
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and other patents pending.

Any infringements of the above Patents will be prosecuted

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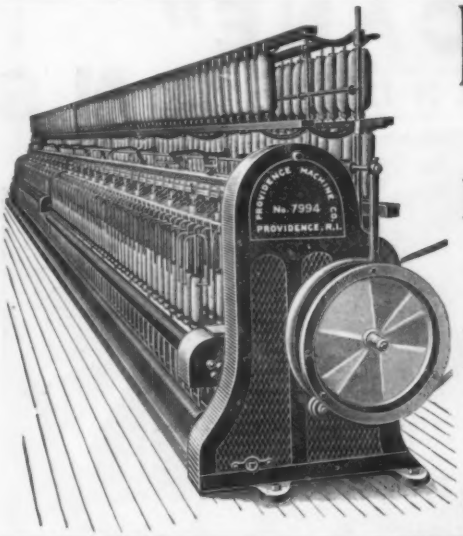

Providence Machine Co.

Manufacturers of

Improved Cotton Roving Frames

Improved Worsted Roving Frames

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An Essential to the Weave Room

WE ARE HEADQUARTERS

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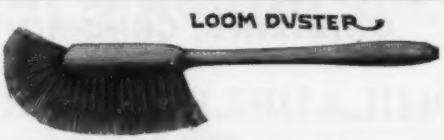

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Fairbairn Lawson Combe Barbour, Ltd.

LAWSON BRANCH,

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MAKERS OF MACHINERY FOR

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PATENT HIGH-SPEED HORIZONTAL AND AUTOMATIC SPINNING FRAMES FOR MANILLA,

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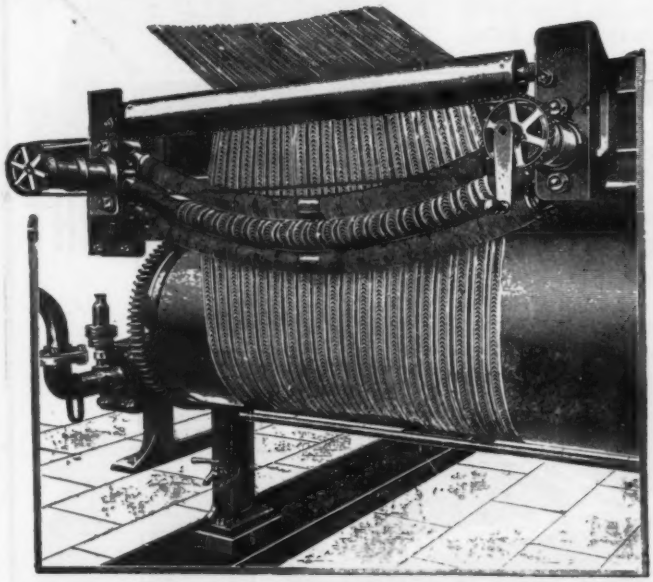
Special Machinery for the manufacture of Rope Yarns and Binder Twine.

IMPROVED LAYING MACHINES. HASKELL-DAWES TUBING TWISTERS

BROWNELL'S PATENT TWISTING AND LAYING MACHINES FOR TWINE.

Complete Plans and Estimates for Flax, Tow, Hemp and Jute Mills, Trawl Twine Factories and Steam Ropeworks.

A PERFECT CLOTH EXPANDER



The recent invention of Wm. Mycock, an English cotton manufacturer. Hundreds sold in Great Britian and on the Continent. Large bleacheries in this country where it has been placed on trial are delighted with it. Gets the full width of goods, with perfectly even tension both ways. Can be attached to calenders or cans. Put it on trial.

Patented in United States, Canada, Great Britain and Continental countries. Infringements will be prosecuted.

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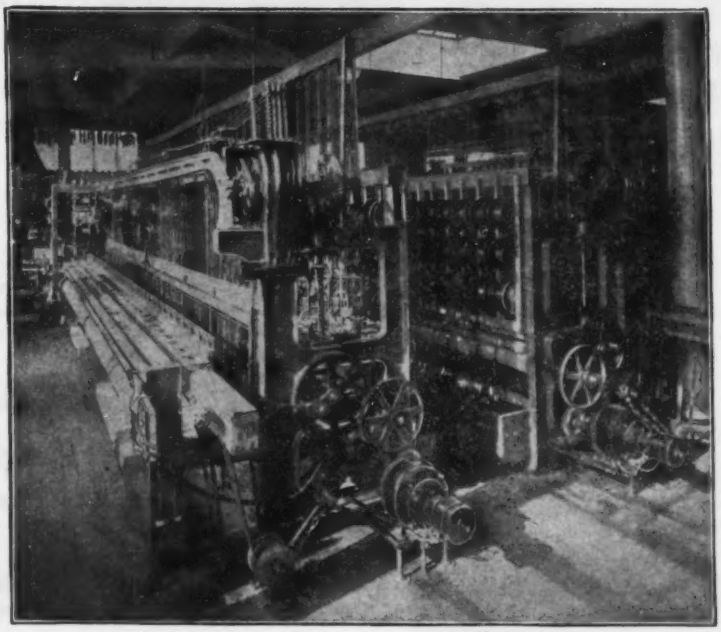

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EVERY

WATSON TEXTILE MOTOR

IS AN

Insurance Policy

against loss through power wasted by belts and shafting.

THE MOST LIBERAL POLICY EVER ISSUED

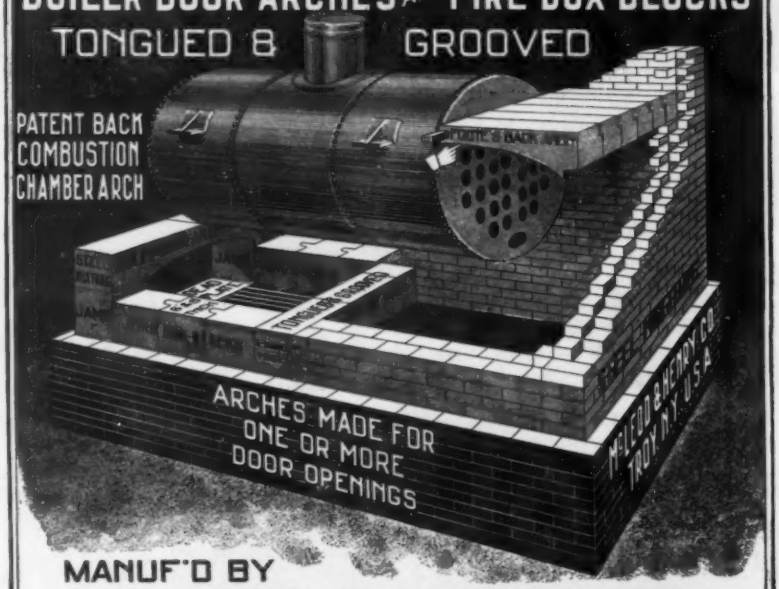
Your Money Back in Three Years and a 33⅓ annual dividend thereafter.

The Mechanical Appliance Co.

Factory—Milwaukee, Wis.

New York Office: 39 Cortlandt St.

"STEEL MIXTURE"
BOILER DOOR ARCHES AND FIRE BOX BLOCKS
TONGUED & GROOVED



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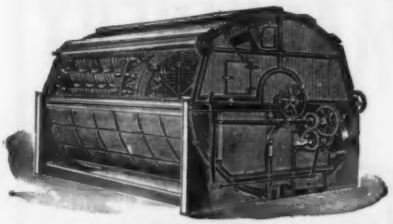
Manufacturers of and Dealers in
WROUGHT AND CAST IRON PIPE
for steam, water and gas.
BRASS, COPPER AND LEAD PIPE.
Iron and Brass Fittings, Valves, Etc.
Iron and Brass Railing and
Awning Fittings. . .
Steam and Hot Water Heating Apparatus.
Steam Specialties, Pipe Fitters' Tools, Etc.
PIPE CUTTING A SPECIALTY.

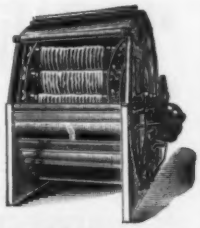
SKEIN AND SLUBBING MACHINES



SAVES

75% in Labor.
30% in Winding.
Steam and Dye Stuffs.
No Friction.
No Tangling.

CAPACITY
50 to 700 lbs per batch.



THE KLAUDER-WELDON DYEING MACHINE CO.

AMSTERDAM, N. Y.

Builders of Machines

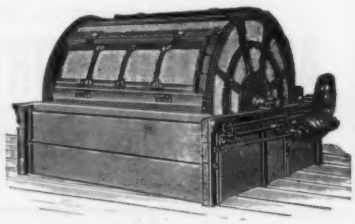
For Skein—Worsted, Slubbing, Cotton and Silk.
" " and Warp Mercerizing.
" Raw Stock Cotton, Wool, Waste and Rags.
" Garments Underwear, Hosiery and Caps
" Sulphur Colors—Raw Stock, Skein and Hosiery.

RAW WOOL AND COTTON MACHINES.

CAPACITY
200 to 1000 lbs per batch.

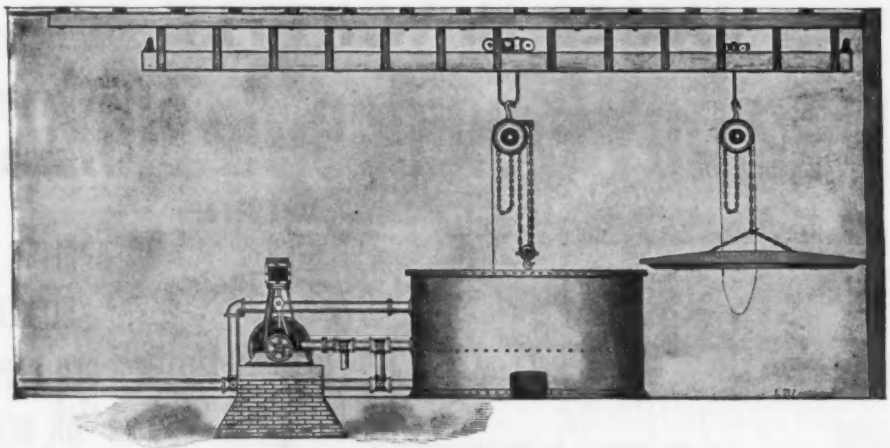
SAVES

50% in Labor besides Steam and Dye Stuffs. Practically indestructible. Leaves stock in perfect condition.



VACUUM DYEING MACHINE CO., CHATTANOOGA, TENN.

RAW STOCK, YARN AND HOSIERY DYEING MACHINES



OFFICE OF TREMONT & SUFFOLK MILLS, LOWELL, MASS., Jan. 14, 1904.

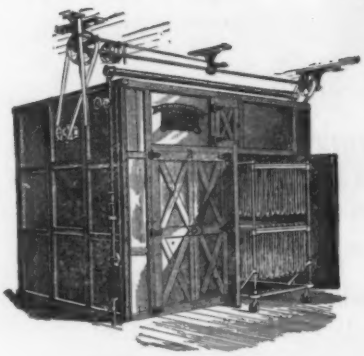
VACUUM DYEING MACHINE CO., Chattanooga, Tenn.

GENTLEMEN: Replying to your inquiry in regard to what we think of your Raw Stock Dyeing Machine, would state that we have been using one about six months, with very satisfactory results, the dyeing being level, and the stock left in first-class condition for spinning. Can give your machine no better recommendation than to say, we think so well of it that we have just placed an order for two additional machines.

Yours truly J. J. CONNELL, Agent.

"20th CENTURY" MACHINERY

DRYERS
for
WOOL,
COTTON STOCK,
YARN, STOCKINGS,
UNDERWEAR.
VENTILATING FANS.
MACHINERY
for
CARBONIZING
and
YARN SCOURING.



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CLOTH WASHERS
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CONTINUOUS SYSTEM
FOR BLEACHING COTTON STOCK.
TOM-TOMS,
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Double Carding Process for Wool

(Patented May 10, 1904)

Is a Great Success.

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INCREASES
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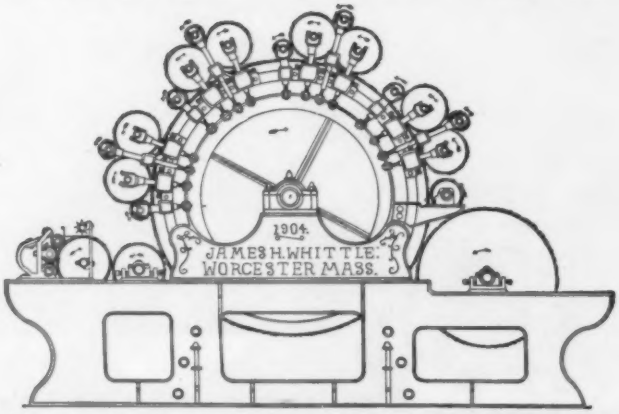

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OLD CARDS
OR NEW

WOOL AND WORSTED MACHINERY

Including Carding Machinery for Wool and Worsted, Yarn Twisters, with or without Novelty Attachments, Yarn Dressers, Reels, Beamers, Single or Double. Yarn Spoolers, Dresser Creels, Cloth Dryers, of all widths, New Rotating Skein Dryers, Four and Eight Drum Spoolers, Improved Hydro Extractors, Improved Dusters with Fan, New Pattern Mixing Picker, Skein Drying Reels, etc.

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Spindles and Flyers, for Cotton, Wool, Silk, Flax, etc.

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Postal will bring Sample.

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C. G. SARGENT'S SONS,

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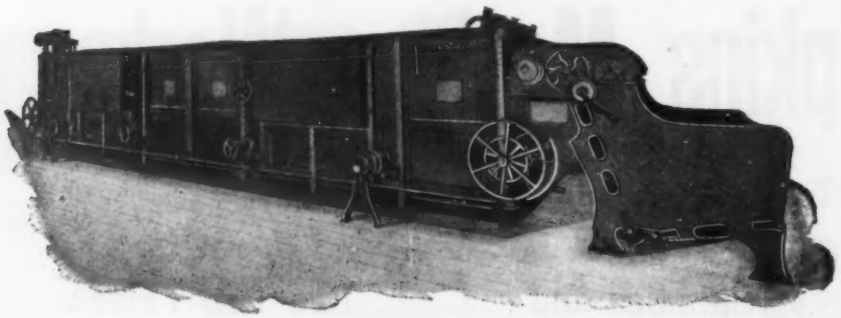

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Stock Dryers, Wool Washers,
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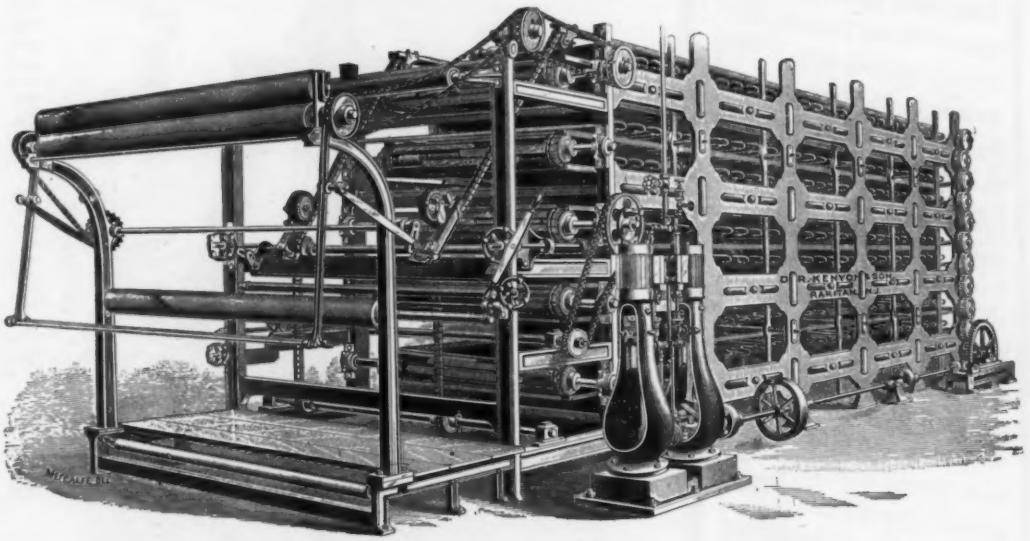
Tentering and Drying Machines

WITH LOW DOWN FEED. PATENTED FEBRUARY 26, 1895.

Tentering and Drying Machines on Pipe System. Special Dryers for Heavy Felt Goods. Hot Air Drying and Tentering Machines.



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Horizontal and Vertical.
Iron Flumes and Penstocks.
Rotary Fire Pumps.
Centrifugal Pumps.
Head Gate Apparatus.
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Endless Felt R'y Washers and Rotary Felling Mills.
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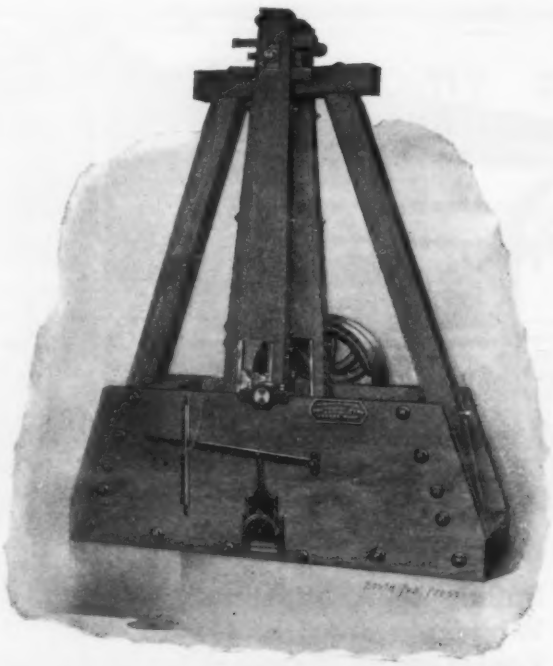

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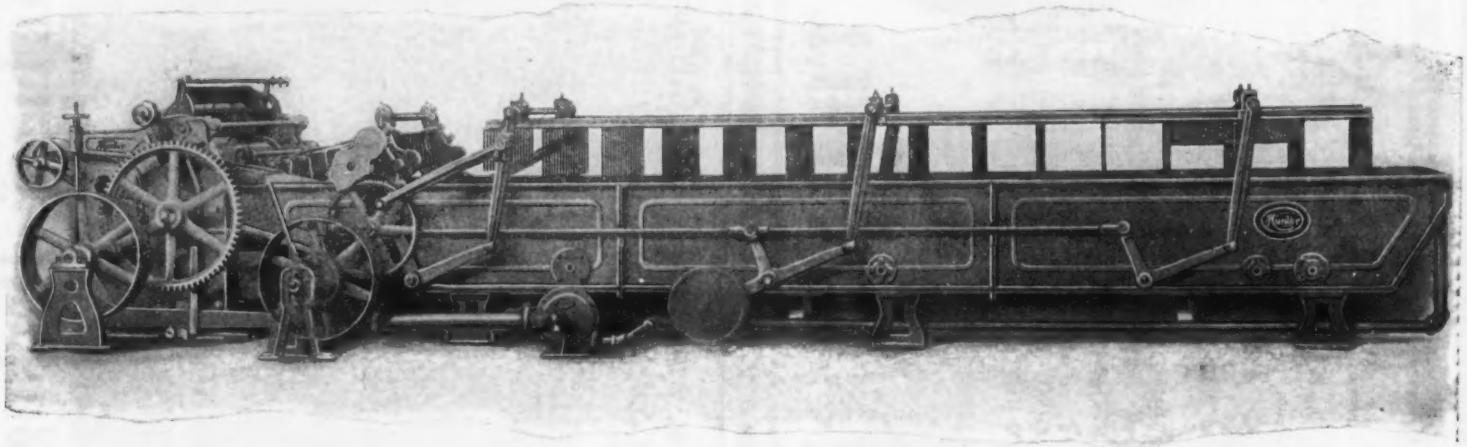

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Built By

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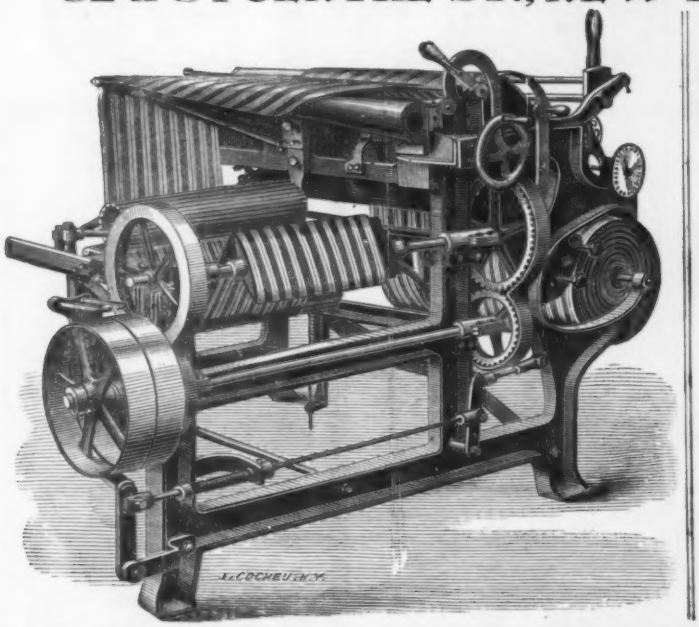
Fabric Measuring & Packaging Co.

82 & 84 CENTRE ST., NEW YORK, U.S.A.



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On Cottons, Woolens and Carpets.

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and imprint the measurement upon fabrics, fold lengthwise and roll into merchantable packages all in one operation.

Prevents claims for short measure.
Marks piece numbers on each package.

A Fully Equipped Machine Shop for General Work.

Patented in the United States and Foreign Countries.

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Interchangeable metal Bushings to fit shafts of different sizes.
Particularly adapted to TEXTILE manufacturing.

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as the best equipped Textile Mills, Cotton Mills and Woolen Mills are doing—it pays to be able to lace a 5″ belt in less than 3 minutes at a cost of one cent—larger belts in proportion.— The Jackson Belt Lacer will do it—and do it in such a way that the belt can be connected or disconnected, shortened or lengthened in a few seconds. Catalog.

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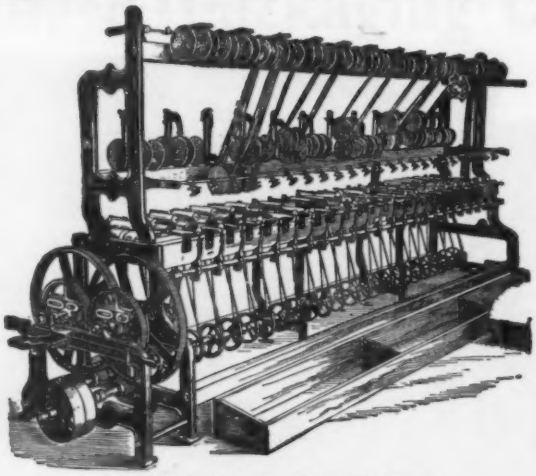
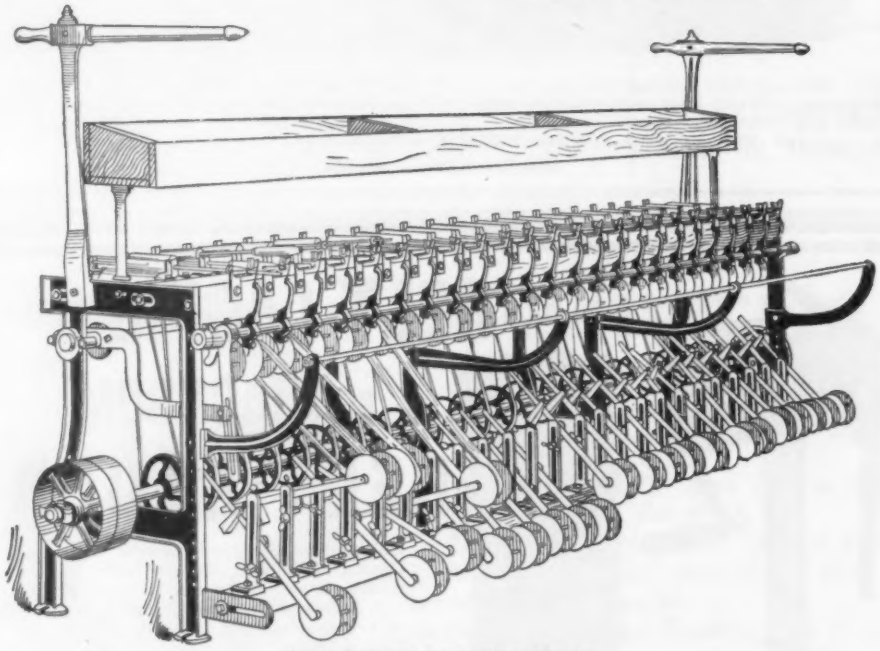


Patent Shuttle Bobbin Winder for Skeins, with Patent Variable Motion.



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Mill Sewing Machines

No. 9—Portable Foot-Power Rotary Sewing Machine.

It is especially adapted for use in Cotton and Woollen Mills, Bleacheries, Print Works at the Printing Machines, in Dye Works, Cloth Rooms, at the Fulling Mill, Shears, Calendars, Gigs, Drying Machines, etc., or any of the different finishing processes in textile mills.

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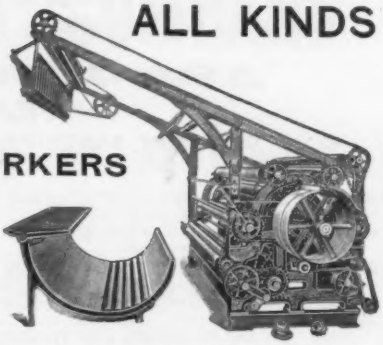
Application Rolls move together



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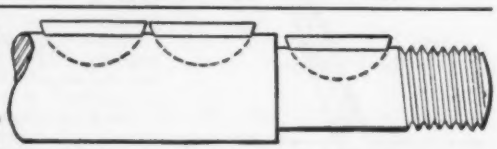
Roving Spindles and Flyers a Specialty. Light Forgings.

REPAIRING OF ALL KINDS.

Key Seating Attachment

FOR

Whiton Gear Cutter



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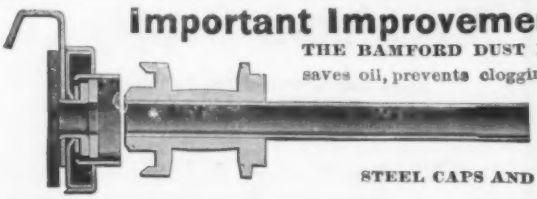
PICK GLASSES, LEATHER APRONS, PATENT WIRE CHAIN APRONS.

Important Improvement in Worsted Spinning.



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PREVENTS BROKEN COPS, SMASHES, WASTE, IMPERFECT GOODS AND ALL THE SHUTTLE TROUBLES WITH COP FILLING . . .

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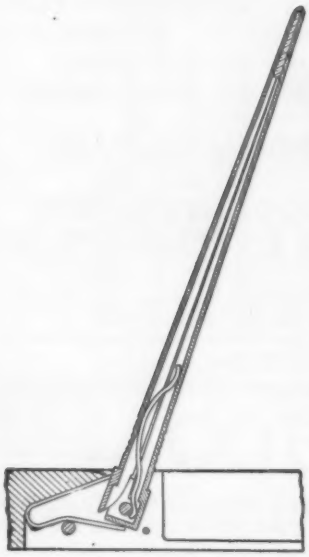
When the spindle is lowered into the shuttle the two parts forming the base are expanded holding the cop firmly in place. The pressure is sufficient to hold the cop on a smooth spindle but the corrugations at the base of the spindle hold the cop still more securely.
The spindle contracts when again raised and the empty cop is easily removed.



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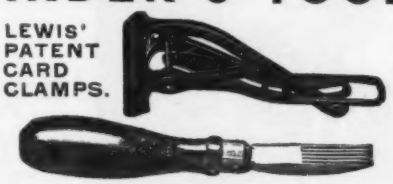

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Mr. SUPERINTENDENT

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Why not let us reflute your detaching rolls and make new top rolls of solid brass with cast-steel hardened ends or bearings. You can then speed up your combers, get more production, and less waste.

Send us your detaching roll, we will fix it for you and make you new top rolls; it will not cost you a cent, and we think it is worth trying.

BAKER MACHINE CO., NEW BEDFORD, MASS.

Note—We have thousands of Bodden flyers in stock, sizes 6, 7 and 8 in. Prices way down.

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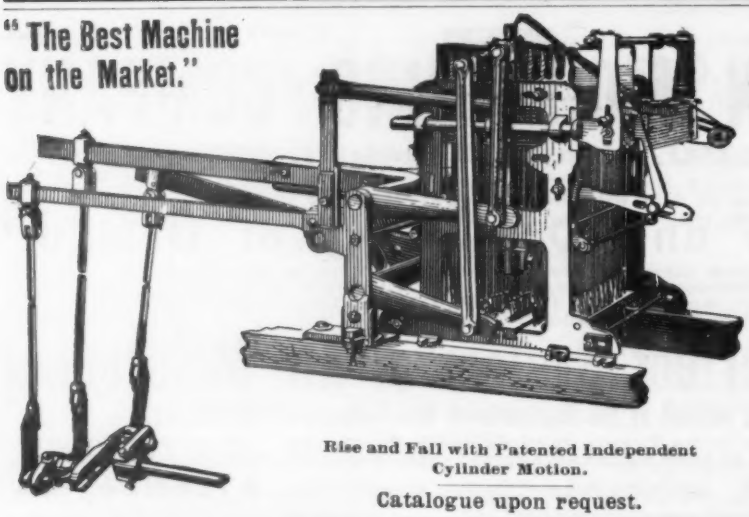

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Catalogue upon request.

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Original Fine Index Machines

Single Lift, Double Lift, Double Cylinder, Rise and Fall, Crossborder.

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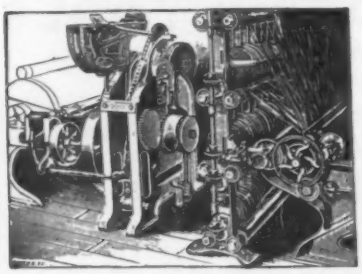

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With all the latest improvements for Wool Cards. The latest and best and only Feed that will make yarn positively even.

ALSO

CHOQUETTE WASTE SAVER. Saves card fly.

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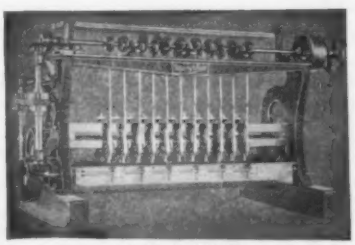
STEAM USERS of this country have upwards of 90,000 Steam Boilers under the inspection and insurance supervision of this company.



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L. F. FALES

MANUFACTURER AND BUILDER OF

SEWING Maniplex MACHINES

FOR ALL PURPOSES WHERE A NUMBER OF ROWS OF SEAMS ARE REQUIRED

BUILT WITH ANY REQUIRED NUMBER OF NEEDLES.

DESIGNER OF SPECIAL MACHINERY | WALPOLE, MASS. U. S. A. | PAPER SLITTING MACHINES

The Metallic Drawing Roll Co.

INDIAN ORCHARD, MASS.

MANUFACTURERS OF

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Especially adapted for Cotton Mills. 25 to 33 per cent more Production Guaranteed. Weight Reduced 33 to 50 per cent. No Leather Covering Bill.

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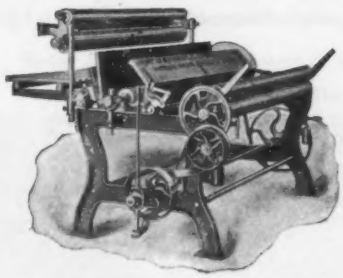

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Curtis & Marble Mch. Co.

WORCESTER, MASS.

R. H. HOOD,

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Maker of

Worsted Machinery,

For Preparing, Finishing Gills and Drawing Boxes

New Screws made and old ones repaired and thoroughly case-hardened

Repairs and new parts for curled hair machinery. Fallers of every description made. Change Gears, 5-8, 7-16, 8-8 and 1-4 inch pitch kept on hand. All kinds of new Fluted Rollers, for Combs, Gills, Drawing and Spinning; also Refluting old ones. Improved Roller Covering Machine.

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Card Grinders

TRAVERSE WHEEL AND LONG ROLL

Particular Attention Paid to Repairing Grinders of All Kinds and Makes

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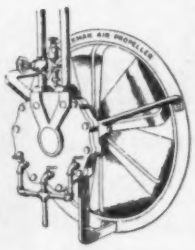
Southern Agent: Stuart W. Cramer, Charlotte, N. C.

Blackman Fans

With Direct Connected Engines.



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Can be run at any speed and any time. No long shafting and belts to waste power.

For Dye Rooms, Factories, Boiler Rooms, or where there is moisture or dust they are the best apparatus ever installed.

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Makers of Rag, Wool, Hair and Finishing Pickers, Automatic Square and Cone Willows, "Schofield" Intermediate Feed for Cards, Rag and Extract Dusters, Waste Pullers, Worsted and Shoddy Reels, All Kinds of Spike and Slat Aprons.

Special Machinery Built General Machinery Repairs

Relagging Picker Cylinders a Specialty

IF YOU DESIRE TO

Heat – Cool – Dry

OR MOVE

Air – Steam – Vapor

IT WILL COST
YOU NOTHING

TO CONSULT US.

WE are ventilating, heating, cooling and drying engineers and experts in air, steam and all vapor moving.

We first like to know what you want to accomplish, or what the trouble is. The study of each case, to know the conditions, location, proper size, speed, etc., are of vital importance.

We often produce remarkable results at slight expense.

We can refer you to

VERY MANY PLANTS WHERE
OUR APPARATUS IS IN DAILY
USE WITH MARKED SUCCESS

Barney Ventilating Fan Works

165 Fort Hill Square, BOSTON, MASS.

ALBERT B. FRANKLIN, Proprietor.

Not Fully Saturated

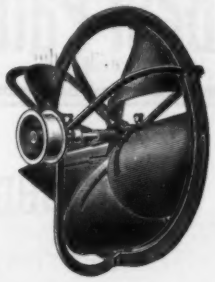
A manufacturer wrote us some time ago:

"The air that comes from my cloth dryer is not fully saturated with moisture, and consequently I think it has not done the work thoroughly. Can you help me get a larger production?"

Is he right or wrong about saturation? Have the temperature, volume of air, the way it is handled and a few other things anything to do with it?

We have been studying such questions relating to drying and ventilation for twenty years, and perhaps our experience may help you, as it did this man.

This is our Berry Wheel, the most effective agent for moving air, eliminating steam and other impurities in the atmosphere.



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SCHUTTE & KOERTING CO.

Engineers and Machinists, 12th and Thompsons Sts., Phila., Pa.

Spray Nozzle emitting water in a fine spray or vapor.

Complete Humidifying Plants

For Woolen Mills, Cotton Mills, Spinning Mills, Silk Mills, etc.

We also manufacture Injectors, Blowers, Condensers, Syphons, High Class Valves, Sulphur Furnaces for Bleaching Purposes.

CORRESPONDENCE SOLICITED.

LATHES—LOOK HERE

IF IT'S A QUESTION OF PRICE

If that's all that stands between you and a high-grade big Lathe, that obstacle is removed by McCabe's "Double Spindle." When we say that this 26-48 inch Machine costs half the price of a regular 48-in. Lathe, don't want you to think this is just a remark dropped in to lend to the drawing strength of the advertisement. Neither are we talking "frenzied finance." Two good bona fide Lathes in this "Double" of McCabe's. 48-inch Triple-geared, and 26-inch Back-geared.

To "make the deed square with the word," we move that the matter be referred to the 500 users for adjustment. Catalog will tell you what they are doing in Textile Mills.

J. J. McCABE,
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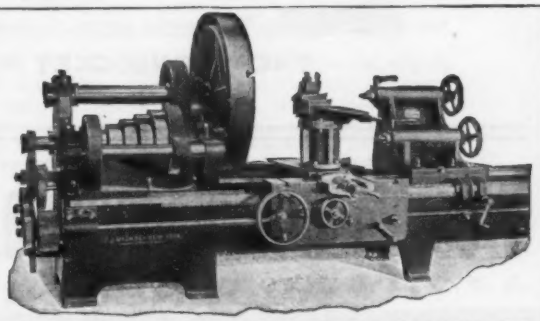


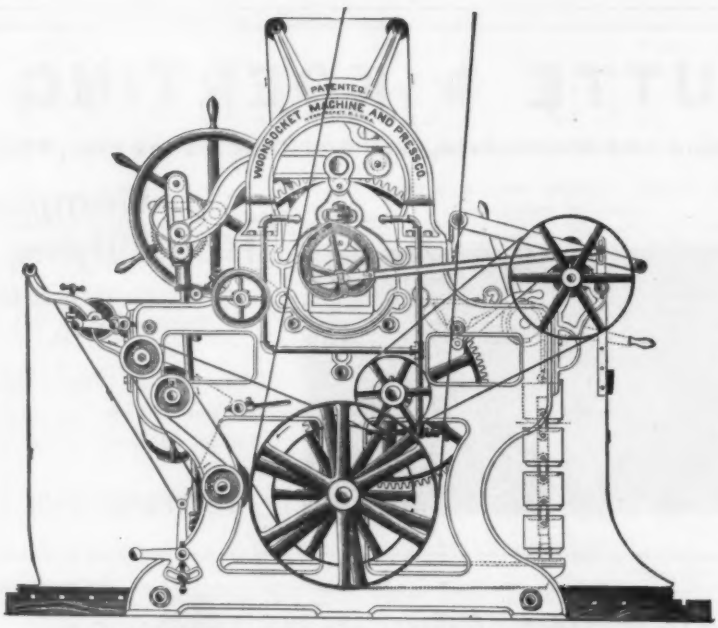
McCabe's "New Style" 26-48 inch "Double Spindle" Lathe.

Best Patent Steam Rotary Cloth Press

Four Separate Pressings In One Machine!

The Only Press that has Self-Yielding Beds with Four Points of Contact

PERFECT TEMPERATURE, POWERFUL, SIMPLE



THE WOONSOCKET ROTARY PRESS.

Woonsocket Machine and Press Company

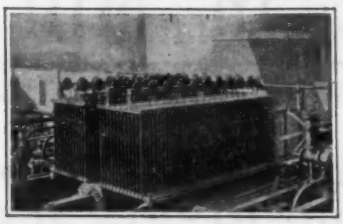
WOONSOCKET, R. I,

GREEN'S ECONOMIZER

Saves 10 to 20% in Fuel.

designed for high or low pressure.

Natural or mechanical draft.



Gives 20 to 40% more steam

Prevents expansion and contraction of boilers.

Many other advantages.

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We've been very successful with installations in

TEXTILE MILLS, BLEACHERIES, COTTON MILLS, ETC.

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Sole Manufacturers in the U. S. A.

FANS BLOWERS EXHAUSTERS PRESSURE BLOWERS ETC.

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OF INTEREST TO TEXTILE MANUFACTURERS.

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VENTILATION & HUMIDIFICATION — BELL PURE AIR AND COOLING CO. — TRADE MARK

Reproduces in the Mill any climatic conditions required. It automatically preserves throughout the year the best conditions of the best climates for textile working.

THE BELL MACHINE delivers air carrying moisture as aqueous vapor, just as it is found in nature, which moistens thoroughly and uniformly. Being SELF-REGULATING it does not keep on moistening when further moistening is useless.

Water delivered as a mist wets rather than moistens; settles on the surface in fine globules instead of being absorbed at once into the fibres. For further particulars address

BELL PURE AIR & COOLING CO.

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Entire Outfits for New Mills, or small and odd items that that you don't know just where to obtain, can be found at the

AMERICAN SUPPLY CO., PROVIDENCE, R. I.

in Mill Supplies.

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—MANUFACTURERS OF—

Card Clothing of Every Description

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Only One "Best"

NORTHROP PICKER

Our Northrop loom pickers are, without any qualification whatever, better made and made from better stock than any other pickers of the same kind which have yet been offered, and their quality is always the same.

GARLAND MFG. CO., Saco, Maine

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Thread and Silk **SPOOLS** of any description made from one piece, up to 6" long and 3 dia.

We are located in the best white birch region. Our work and prices seem to satisfy the most particular customers. We can give any finish desired. Estimates furnished on samples submitted.

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Successors to The Bridesburg Mfg. Co.

In the Manufacturing of **SPINDLES,**

For Cotton, Woolen, Worsted, Silk and Flax Machinery. Manufacturers and Repairers. Also Flyers, Steel Caps, Bolsters, Steps, Tubes, Etc.

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Manfrs of *BRAIDING MACHINES*

for making Dress Trimming Braids, Cotton Tapes, Underwear Braids, Shoe Laces, Spindle Banding, etc. Winders, Doublers. Measuring Machines, Reelers, Singeing and Finishing Machinery. Special Machinery.

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For Textile Mills

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Leather Belting	Heddles	Yarn Scales	Belt Hooks
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The Best That Money Can Buy

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Sole Manufacturer in the United States of
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Brass and Steel **MAILS**

FOR SALE.
Yorkshire Teasel Gigs and Slats
Write for particulars to
W. W. CRANE FOUNDRY AND MACHINE WORKS,
122-124 Clark St., Auburn, N. Y.

Reels for Cotton WOOLEN AND WORSTED
Patented Hosiery Winders, Cop Winders and Spoolers.
LINDSAY, HYDE & CO.,
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SAVE
Their Cost
In Freight.

THE CHAFFEE PATENT CLOTH BOARD,
Made of paper and wood,
Needs no covers,
Will not split or warp;
Not liable to break.
BOX SHOOKS and CLOTH BOARDS.

Clean
LIGHT
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Shaw's "Victor" Travelers
Manufactured by
VICTOR SHAW RING TRAVELER CO.
Incorporated 1899.
23 Sabin Street, PROVIDENCE, R. I.

Established 1870

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Builders of Improved

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for WOOLENS, WORSTEDS, FELTS, etc.

Built Upright or Horizontal with Low Down Feed

Ventilating Fans a Specialty

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BUILDER OF

YARN DRYING MACHINERY

ON THE

COLD AIR SYSTEM. Simple, effective, inexpensive. Leaves yarn in beautiful condition.

ALSO ON THE

HOT AIR SYSTEM when great capacity is wanted.

DYE STICKS, Kettle Sticks and dry and sulphur house Poles, also Sticks to suit the Wolstenholm Machine from natural water grown cedar, and Sticks to suit the Klauder-Weldon, Lorimer and Hussong machines from finer grades of lumber. These Sticks have been thoroughly tested, and pronounced the best on the market. Guarantee satisfaction to buyers. Write for prices.

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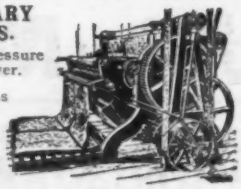
LATEST MILLER ROTARY STEAM CLOTH PRESS.

Patent Flexible Steel Bed. Pressure automatically appplied by power.

16/4 double bed second-hand press
16/4 single " " "

at a bargain.



Miller Press & Machine Co.

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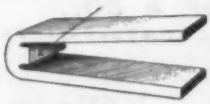

The Latest and

Best Lug Strap

Note the CUSHION

that comes in contact with Picker Stick

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Is Acknowledged to be

THE BEST FIRE HOSE MADE

For use in

Cotton Mills, Woolen Mills and Factories.

(Trade Mark)

Seamless Woven and Rubber lined EUREKA COTTON HOSE, "TROJAN" brand, has no equal. Send for circular and Testimonials.

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TEXTILE MANUFACTURERS

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Undoubtedly Standard **U. S. ROOFING** ***Unquestionable Superiority***

Made of fine wool felt, chemically treated, coated on both sides, waterproof and durable, guaranteed.

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Correspondence Solicited. **Bound Brook, N. J.**

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MADE BY

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It is the BEST

Because

It Lasts Longest
Does Perfect Work.
Needs Less Grinding.

WRITE FOR SAMPLES AND PRICES TO

The

L. M. Bowes Co.

451 Atlantic Avenue,

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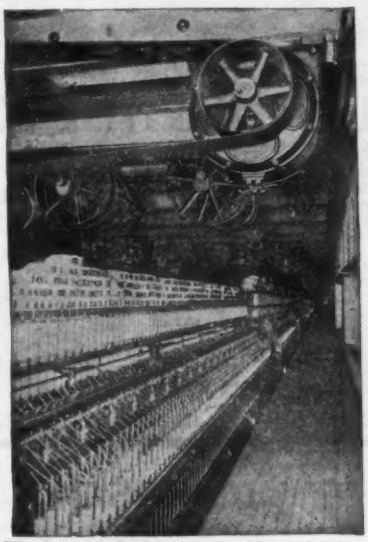
Westinghouse Type C Motor



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Increases Production
Decreases Costs

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Sales Offices in all large cities.

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Specialist in the Manufacture of

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of all kinds. The oldest Cloth Shearing Knife Mfr. in Germany.
American Agents Wanted.

The Lane Patent Steel Frame
Canvas Steaming Basket

MADE WITH OR WITHOUT WOODEN SHOES AS REQUIRED

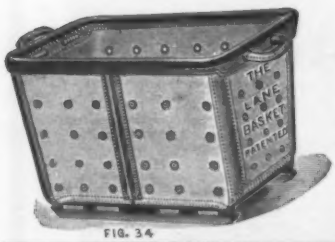

FIG. 34

Adapted to withstand the severe test of steaming better than any other basket, as it is constructed of such materials, and in such a manner as to be unaffected by steam, heat or moisture.

The steadily increasing demand for the Lane Patent Steaming Basket demonstrates the truth of our claims.

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Formerly located at Port Chester, N. Y. POUGHKEEPSIE, N. Y.

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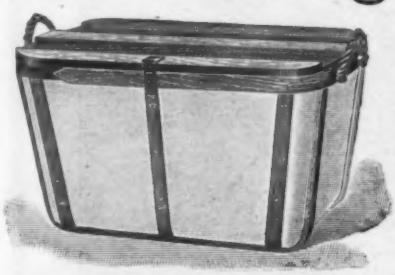

with or without covers or castors.

Light, Strong and Cheap.
Just the Basket for **Textile Mill Use.**

BASKETS all sizes and shapes, both Rattan or Ash.
MILL TRUCKS, Extra Strapped. All Sizes.

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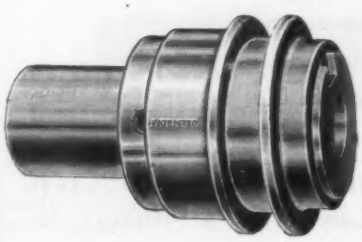
BURLINGTON, IOWA.

THE JOHNSON FRICTION CLUTCHES

SINGLE AND DOUBLE



For Machines, Countershafts, Lineshafts, Etc.

They are especially adapted for Textile Machinery. Very compact, powerful and neat, having a perfectly smooth surface eliminating the possibility of accidents. They can be instantly adjusted, as required, by one screw. Operate easily and work perfectly at any speed. They are being used by many of the leading manufacturers who endorse them in the highest terms.

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ELECTRIC POWER AND LIGHTING PLANTS

FOR ALL CLASSES OF

TEXTILE MILLS.

73,000 Horse Power in use or under contract.

THE ADVANTAGES OF ELECTRIC DRIVE ARE:

Saving in the cost of building, shafting and belting and of investment for future extension.
Increased production and fewer "seconds" due to absolute uniformity in speed.
More product per horse power at the engine.
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The General Electric Company employs specialists trained in textile work, whose services are at disposal of engineers or manufacturers for consultation or advice.

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BODY—Vulcanized Fibre. SIDE SEAM—Riveted with Patented Clinched Rivets. RINGS—Tinned Steel, Brazed Joints, Curled Edges. BOTTOM—IXXX. Tin Star Corrugation; Fastened without the use of nails or screws, will not crack, warp or shrink and cannot come out. FINISH—Coated inside and out with moisture proof coating, handsome and smooth. WEIGHT—About one-half pound per inch diameter. SIZE—All cans to any exact size, perfectly round and true. DURABILITY—Superior to any other can.

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HILL'S IXXX TIN AND GALVANIZED IRON DYE HOUSE CAN.

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EVANS' FRICTION CONES.

Eight Thousand Sets in Operation in This Country and Europe.

A partial list of manufacturers who have Evans' Friction Cone Pulleys in operation, transmitting from ONE TO FORTY HORSEPOWER:

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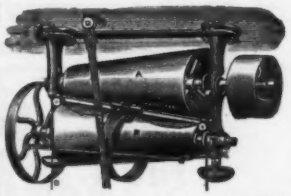

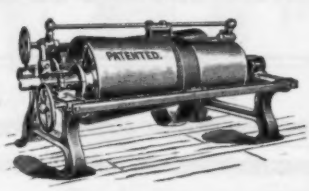

Smith & Winchester Co., So. Windham, Conn., 250 sets. Furguson & McRae, Belfast, Ireland, 25 sets. Mercantile Laundry, So. Windham, Conn., 250 sets. Washburn & Moen, Worcester, Mass., large number, all sizes. Dennison Tag Co., Boston, Mass., large number, small sizes. Saco & Pettee Machine Co., Newton, Mass., 275 sets. Pacific Mills, Lawrence, Mass., 13 sets.

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This Trade Mark on every package.

Reg. U. S. Pat. Of.

Look out for YELLOW Label.

There is only **ONE**

ALBANY GREASE

AND WE ARE THE ONLY MAKERS.

We have solved the problem of economical lubrication.

Cost of using oil

Cost of using Albany Grease

OUR SPECIAL OFFER, a Sample Can of Albany Grease with an Albany Grease Cup free of charge or expense for testing. The only information necessary to send is pipe connection in bearing, DEPTH OF OIL HOLE FROM TOP OF TAP TO JOURNAL, and give particular part of machinery on which the same is to be used.

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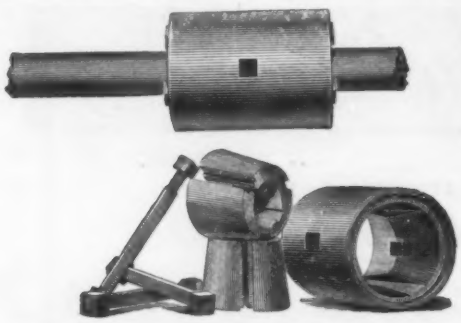

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DOUBLE CONE VISE COUPLING

has a way of holding shafts together, that no other COUPLING can equal.

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Makers of

SHAFTS,
COUPLINGS,
PULLEYS,
HANGERS,

and all most approved appliances for the

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MACHINE TOOLS.
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Singeing Machines

FOR ALL KINDS AND WIDTHS OF GOODS.

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ELEVATORS

ESPECIALLY ADAPTED FOR MILL USE.

SEND FOR ILLUSTRATED CATALOGUE AND ESTIMATE.

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This giant has arms of iron and muscles of steel. He can do the work of ten men in factory, foundry, shop or warehouse. His other name is

THE COBURN TROLLEY TRACK

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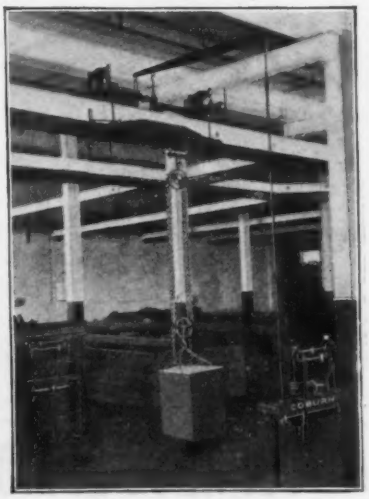

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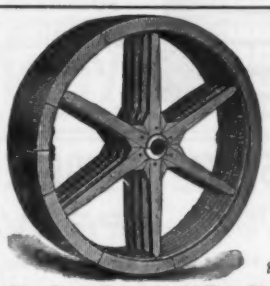

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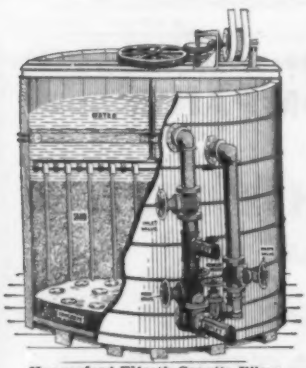

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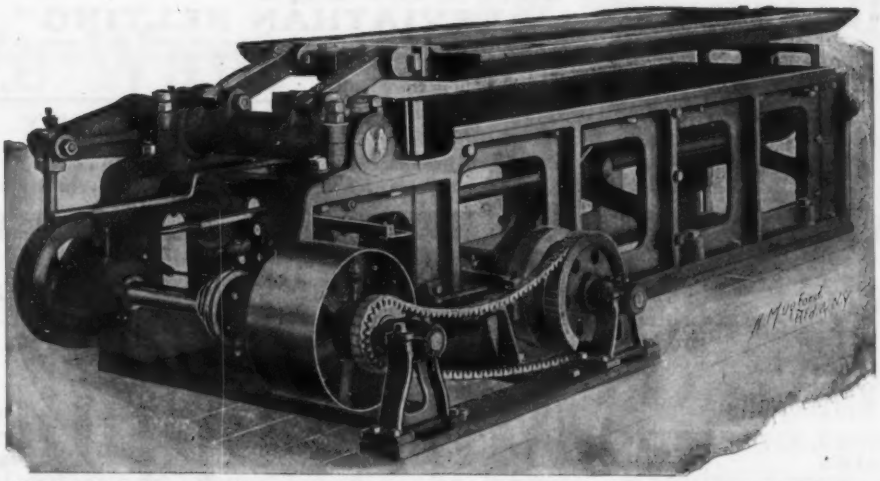

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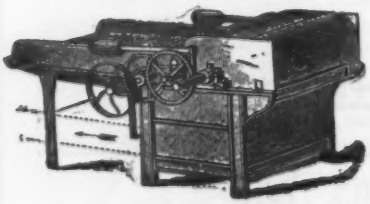

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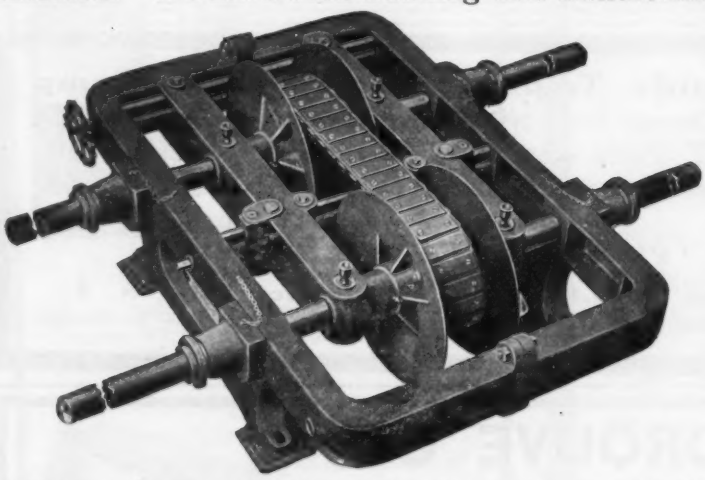

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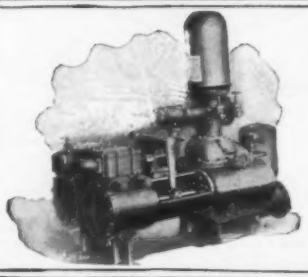

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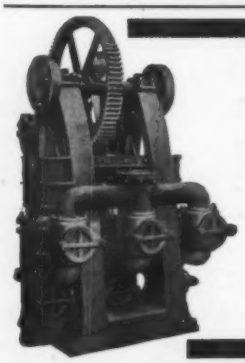

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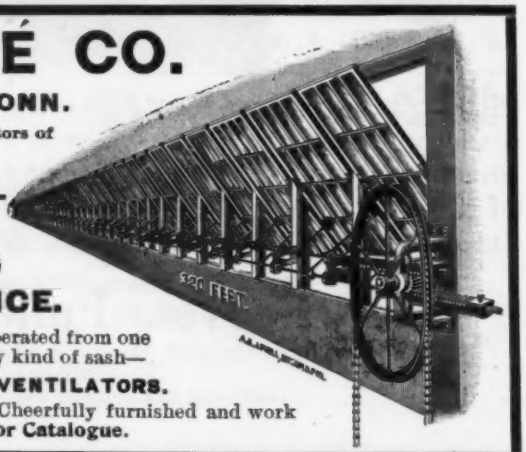

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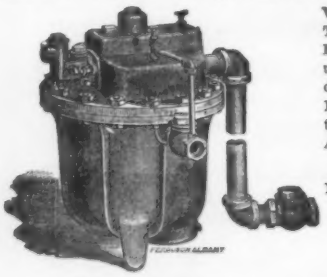

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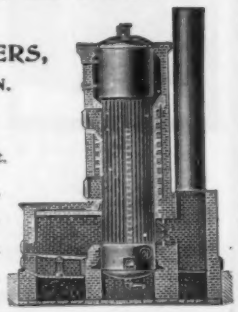

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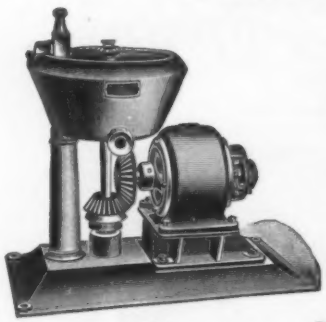

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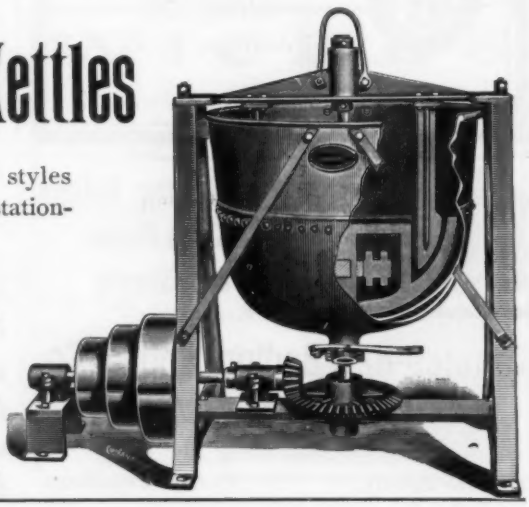

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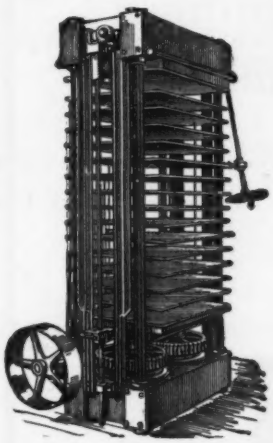

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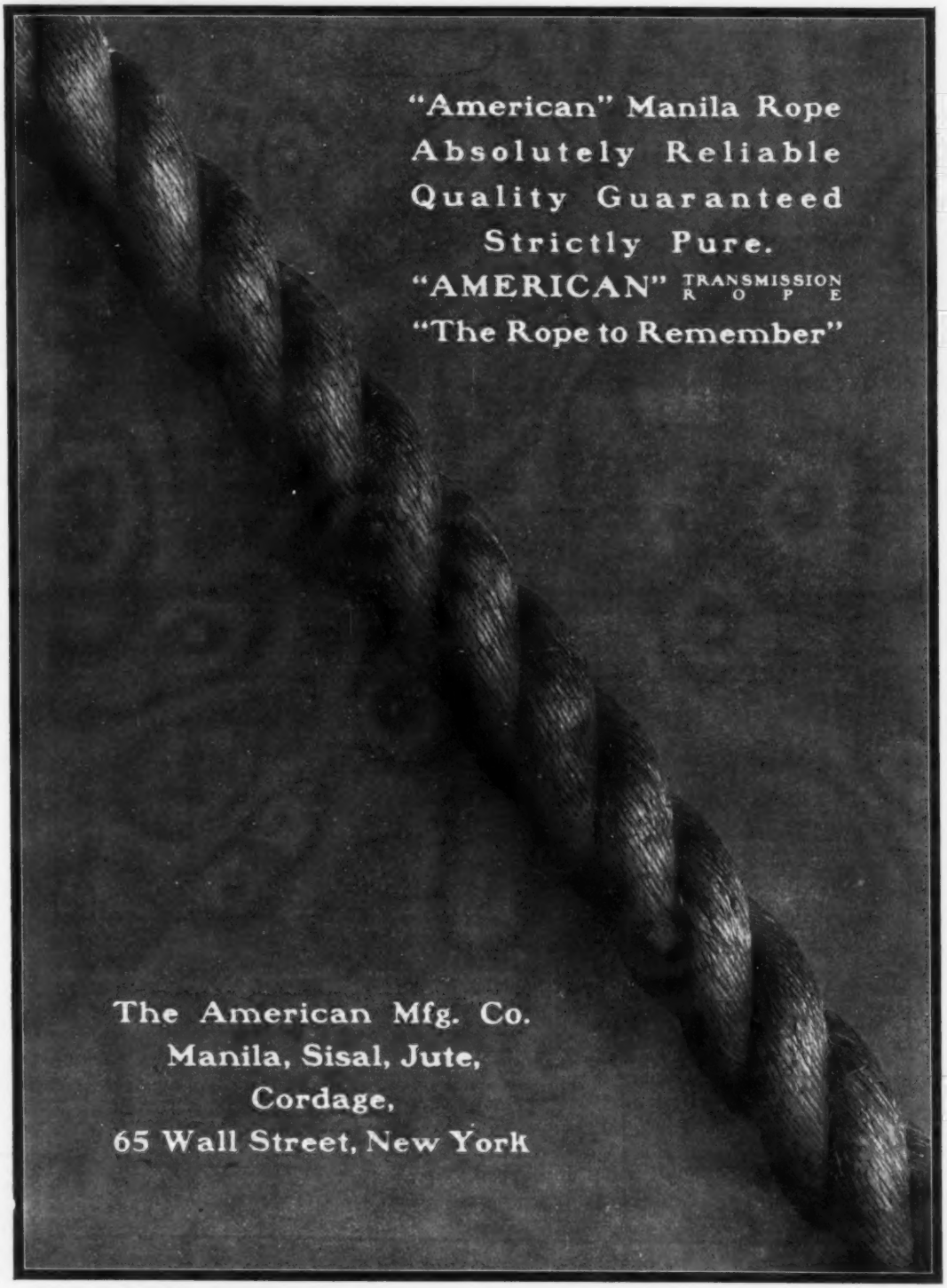
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TEXTILE WORLD RECORD.

Published Monthly by

LORD & NAGLE COMPANY,

FRANK L. NAGLE, President. HENRY G. LORD, Treasurer.

MAIN OFFICES:

299 Devonshire St., Cor. Summer St., Boston, Publication and Editorial Offices.

425 Walnut Street, Philadelphia.

BRANCH OFFICES:

123 Liberty St., New York. 115 Dearborn St., Chicago.

Entered at the Boston Post Office as Second-Class Mail Matter.

SAMUEL S. DALE, Editor. E. A. POSSELT, Editor Process Department.

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The **Textile World Record**, including **Annual Official Directory** (Traveler's Edition),	$3.00 per year
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There are 22 textile maps; gives population of town and railroad connections.

PART II. Is the Yarn Trade Index, containing classified lists of yarn spinners, arranged according to kind of yarn, size and number spun, etc. All the mills with worsted machinery are included in this section.

PART III. Contains classified list of mills doing order and commission work, also dyeing, finishing, bleaching and printing establishments, classified according to the kind of work done, and so far as possible giving width of goods handled; also shoddy, extract and flock manufacturers and wool scouring establishments.

PART IV. Manufacturer's Selling Agents and Dry Goods Commission Merchants, giving the name and address of concern, character of goods handled, different departments, with managers, list of manufacturing clothiers, and suit and cloak manufacturers, giving specialties and buyers names. A list of city offices of textile mills is given.

PART V. Dealers and Brokers in raw materials and stock, including wool and shoddy dealers and brokers, cotton dealers and brokers, factors and buyers and wholesale rag dealers making a specialty of textile interests.

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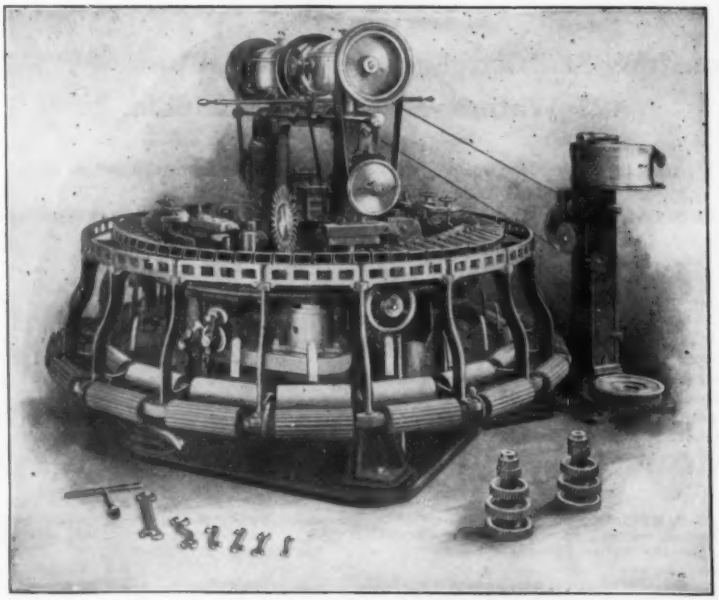
WOOL COMBS



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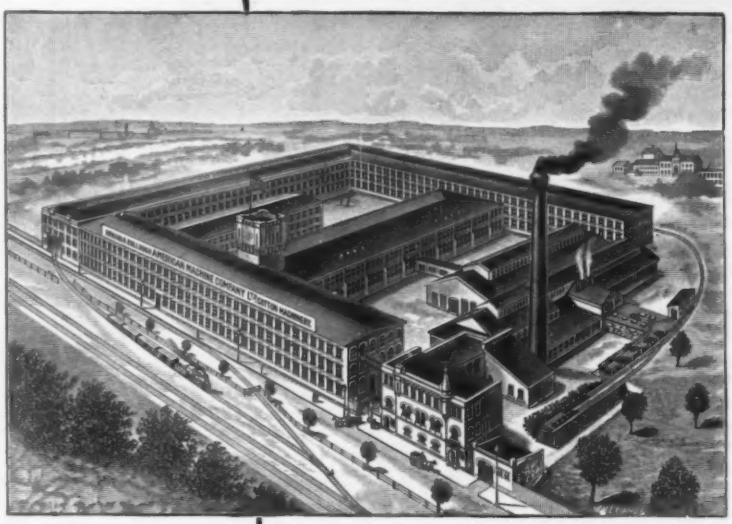

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VOL. 28. (NEW SERIES.) APRIL, 1905 No. 1

Monthly Comment.

Moisture in Imported Wool.

Certain large importers of wool are reported to have appealed to the Secretary of the Treasury to relieve them from the burden of paying the import duty on that part of the weight of the wool represented by the excess of water that the material may contain. Wool is very hygroscopic, some grades absorbing as much as 35 per cent. of its weight of water without feeling damp. Assuming 100,000 pounds of imported wool of the second class dutiable at 12 cents per pound to consist in its normal condition of 15 per cent. of water, and in its actual condition, 20 per cent. of water, the duty paid on the excess of water is calculated as follows: There is 80 per cent. or 80,000 pounds of dry wool in the lot. Under normal conditions of moisture this 80,000 pounds would be 85 per cent. of the total weight, which would then be (80,000 ÷ .85) = 94,118 pounds. Then:

		Duty.
100,000 lbs. actual	12c.	$12,000.00
94,119 lbs. (normal)	12c.	11,294.16
5,882 lbs. water in excess		$705.84

On this invoice the importer paid $705.84 on the 5882 pounds or 706 gallons water in excess of the normal quantity, nearly six per cent. of the value of the wool. Applying this rate, which is by no means excessive, to the wool imported in 1904, which was valued at $29,355,344, we find that $1,761,320.64 was paid last year in the form of an import duty on the excess of water in the wool. The Secretary has been duly impressed with the showing and is now considering ways and means by which the suffering importers can be relieved from this heavy burden.

There is, however, another side to the question. The importers pay this tax on the excess of water, but there is not one of them, unless he is a manufacturer, who does not transfer it to the mills or other dealers when he sells the wool. If the wool is imported by a manufacturer for his own use the excess tax may be borne by his mill, but not necessarily. If he is a yarn manufacturer, he has a chance, which seldom goes unimproved to pass the burden to the weaver.

The duties collected by the Government on the excess of water is ultimately paid by the consumer, because the weaver adds it to the cost of the goods.

It is a serious burden to pay a tax of 12 cents per pound on water of no value, but it is still more serious to be called upon to pay the price of wool for that water, and this is what the mills and ultimately the consumer is compelled to do. Referring to the example already given, let us suppose the wool cost 24 cents per pound, or 36 cents duty paid. At this rate the 5882 pounds of water in excess would amount to $2117.52.

and on the total imports of wool last year, the domestic consumer would have paid $5,283,961.92 for water. This, of course, is a rough estimate, but will serve to illustrate the conditions that exist. It is evident that in seeking to relieve the importers the Secretary of the Treasury fails to touch the real problem, which involves that of conditioning textile fibres. Here he will meet with the fact that there is no standard of moisture legally established for wool. Until such a standard is recognized it would be the rankest injustice to relieve importers from paying the duty on the excess water, while allowing them to sell the water to the mills at the price of wool.

Long Bobbins and Stop Motions.

One-half the labor cost of converting raw cotton into medium cotton goods consists of the labor cost of weaving. The labor outside of weaving is distributed among a large number of processes, picking, carding, combing, spinning, spooling, warping and finishing. While the effort to reduce cost is as constant and strenuous in one department as another, it attracts more attention in the weave room because of the high cost of that process and the large number of operatives working there by the piece. The latest development in the effort to reduce the cost of weaving is the use of longer bobbins in connection with warp stop motions. Some of the New England mills have made these changes in their looms and reduced the weaving price per cut in consequence. The weavers have refused to submit to the reduction. As a consequence two mills in Fall River are involved in a labor dispute within ten weeks after the close of the struggle that lasted from July 25, 1904, to Feb. 18, 1905.

As questions of far-reaching importance to the textile industry are involved, the Textile World Record has made a personal investigation of the conditions in order to present the facts to its readers. Last year, before the reduction of 12 1/2 per cent., the wages of the Fall River weavers were on a basis of 19.8 cents per cut for regular print cloths. The reduction lowered this to 17.32 cents, which is the nominal basis now. Under the old schedules one weaver ran about eight looms. Very few of the print cloth looms are fitted with warp stop motions. Besides print cloths, there is a wide variety of finer fabrics made in Fall River, for which the looms in some of the mills have been equipped with warp stop motions and long filling bobbins. The old or short bobbin, which was about seven inches in length is shown at Fig. 1; the new or longer bobbin, at Fig. 2. With

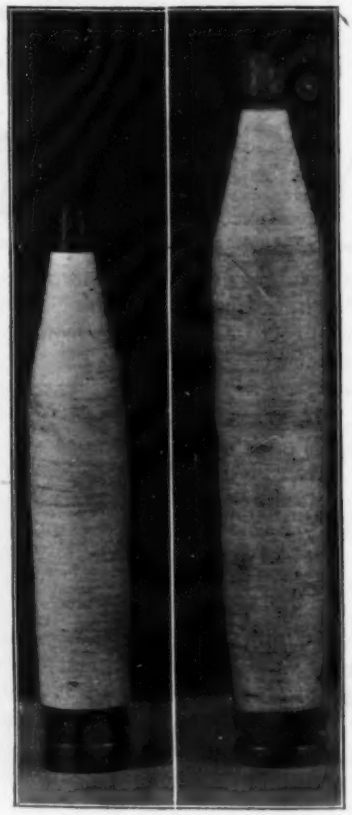


FIG. 1. FIG. 2.

the introduction of the longer bobbin and the warp stop motion several of the mills reduced the price list for weaving the finer goods 33 1/3 per cent. and then added 10 per cent. Thus a rate of 30 cents per cut was reduced one-third to 20 cents, then increased 10 per cent. to 22 cents, making a net reduction of 8 cents from the original 30 cents.

The weaver has the usual privilege of running as many looms as she can.

The position of the manufacturer can be stated in a few words. He claims that there being more yarn on the longer bobbin, it is not necessary to change shuttles so frequently; and that the warp stop motion stops the loom automatically when a warp thread breaks so that it is not necessary for the weavers to watch the cloth in each loom as closely as before; that in consequence the

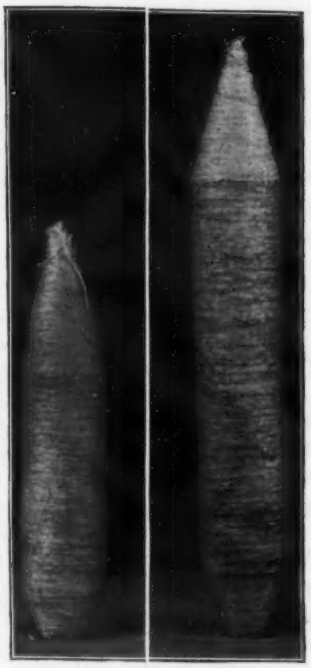


FIG. 3. FIG. 4.

weavers can attend more looms without additional effort, and that at the reduction of 26 2/3 per cent. they can, with less exertion, earn more with the longer bobbins and stop motions than at the full rate without these appliances.

One manufacturer claims that under the long bobbin schedule one weaver can run as many as sixteen looms and earn as much as before the 12 1/2 per cent. reduction last summer.

On the other hand the weavers claim that the lengthening of the bobbin cannot be called an improvement; that since the introduction of the fly shuttle, in fact ever since yarn was spun, the advantages of a long bobbin have been self-evident, and that it has ever been the constant endeavor of textile workers to use a bobbin carrying as much material as practicable, just as in carrying water it is customary to use as large a pail as practicable; that with yarn, as with water, the size of the receptacle is limited by practical considerations, and that in the textile

FIG. 5.

case under question those limits have been passed. They claim that the yarn breaks more frequently when woven from the longer bobbin owing to the greater strain on the thread arising from the tendency of the shuttle spindle carrying the heavy bobbin to tip up or down and cause the yarn to drag over the nose of the bobbin. This causes the yarn to break and leaves the bobbins, like the one shown at Fig. 5, partly filled with

yarn which cannot be used without additional loss of time owing to the liability to further breakage, and which cannot be cut from the bobbin or left unused because of the rigid rules of the mill. The weavers also claim that the increase in the quantity of yarn by reason of lengthening the bobbin is overestimated by the manufacturers. They state that the warp stop motion is a valuable means of obtaining perfect cloth; that it is a necessity on certain fabrics, curtain cloths for example, where a thread missing for even a short distance allows the light to shine through the fabric and thus causes a serious imperfection; but that its labor saving value is infinitesimal. To support the last named contention they point to the fact that when the warp stop motion stops the loom it also stops the weaver's wages on that loom, and that without that stop motion the loom would have continued running until the weaver detected the broken thread, which would occur before it ran very far, say one-half of an inch or an inch, which in many fabrics would not constitute a defect. The weavers claim that the warp stop motion is a valuable cloth perfecting device, not a labor saving device. It stops the loom, but the weaver must tie the thread in place. They add that in this dispute the weavers are the best judges of whether the 26 2/3 per cent. is just, because they do the work, while their employers have no such means of determining the facts.

We have briefly stated the opposing claims in this labor trouble, omitting the usual charges of bad faith and unfairness, which to a greater or less extent are inseparable from all bargaining between human beings. The whole question hinges on whether a reduction of 26 2/3 per cent. is warranted by the lengthening of the bobbin and the use of the warp stop motion. To aid in determining the facts, where employer and employee are in direct disagreement, we have obtained from the Fall River mills samples of the various bobbins and cops, and carefully weighed the yarn to determine how much each bobbin or cop carries.

Fig. 1 is the old or short bobbin. Fig. 2 the new or long bobbin. Fig. 3 a small cop. Fig. 4 a long cop. The following table gives the quantity of yarn on each, also the time each will run on 36s with the loom running 180 picks per minute on 26-inch goods:

	Short Bobbin. 7-inch.	Long Bobbin. 8½-inch.	Short Cop.	Long Cop.
Weight of yarn	361 grains	766 grains	273 grains	587 grains
Length single 36s.	1900 yards	3309 yards	479 yards	2530 yards
Running time, 26-inch goods....	12 min.	25½ min.	3⅜ min.	19½ min.
Bobbins per 10 h'rs (continuous)..	50	23½	163	30¾

The cops are included in the statement, but have only an indirect bearing on the controversy, because most of the filling is frame spun. There are also various technical considerations which prevent a direct comparison between cops and bobbins.

We have now outlined the claims of both sides and given the facts as we find them. It is obviously impossible for anyone to decide this question beyond the possibility of error. As well might one try to calculate the speed of a horse before and after a change in the load he carries. Such problems can be solved only by a practical test.

Back of the present dispute at Fall River is the question of competition between the North and South. The Southern mills with longer working hours, lower wages, and practically unrestricted employment of women and minors, can make cloth at less cost and consequently are able to undersell the Northern product. If the increase in the length of the filling bobbin from seven to eight and one-half inches and the use of stop motions does not fully compensate the weaver for the reduction of 26 2/3 per cent. in the price list at Fall River, the difference is simply a step toward bringing Northern wages to the Southern level. It has been the hope of all, employer and employed, that the difference in industrial conditions between the sections would disappear by reason of equalization of supply and demand for labor throughout the country, and the consequent raising of Southern wages to the Northern level. There are unmistakable indications that such a process is now in operation. When once completed on that line the only danger from low priced labor will be found in the mills of foreign countries, a danger against which, fortunately, the American mills are well protected.

The number of twists in the cotton fibre in the raw state is said to be from 300 to 500 per inch.

The Canadian Woolen Industry That Might Have Been.

The process of strangling the Canadian woolen industry by a preferential tariff is steadily progressing. The Montreal Woolen Co. is the latest victim, having closed its doors last month owing to the low prices of goods and overstocked market. While the bulk of the importations consist of British goods, it is stated that German goods are shipped to England and then exported to Canada as a British product subject to the lower rate. The Canadian mill owners have found it impossible to compete with the foreign goods and have been forced to choose between shutting down at once and running their mills at a steady loss in the hope than conditions would improve. Instead of improving they have become worse, and the mills that were kept in operation are being forced to the wall. The general business conditions in the Dominion are prosperous. The immense agricultural and mining resources of the country are attracting capital and the population is being increased by a large number of immigrants of the better class from the United States and Europe. The textile industry is the fly in the Canadian ointment.

The Canadian woolen industry having been practically wiped out by a low tariff, it is interesting and profitable to estimate the loss to the Dominion. The best, in fact the only available basis for such an estimate is by comparison with the United States, where the tariff on woolen goods is practically prohibitive. Woolens are still imported into the States at the rate of $16,000,000 per year, but this is due to the demand for special articles of luxury or to the ignorant prejudice in favor of "imported goods," and can be ignored in our estimate, which is intended to show what Canada loses by not having a Dingley tariff.

For the comparison we will take the United States census of 1900 as a basis. According to that report the annual per capita value of the woolen goods manufactured in the mills of the United States amounted to $3.96. Owing to a more rigorous climate more wool is needed per capita in Canada than in the States. In the Southern states a comparatively insignificant amount of woolen clothing is worn, cotton being the chief material, while wool is a necessity in every part of the Dominion. Estimating the increase in the use of woolen clothing due to the more northern climate at 25 per cent., we have $4.95 as the per capita value (at the mill) of woolen goods annually consumed in Canada, or a total of $29,700,000 per year for the 6,000,000 inhabitants of British America. To supply these goods a woolen industry of the following proportions would be necessary, the estimate being based on the United States census of 1900, which supplied a population of 75,000,000:

Capital	$31,017,975
Wage earners (including salaried officers)	16,360
Wages and salaries	$6,439,931
Miscellaneous expenses	$1,732,992
Raw materials	$18,115,912
Value of products	$29,700,000

These figures, moreover, do not represent the full extent of the loss. They do not include the wool growing industry to supply the raw material, and for which the climate and soil of Canada are well adapted, nor the many industries supported by woolen manufacturing, such as the mining of coal and the manufacture of all kinds of mill supplies; nor do they show the general loss to farmers, merchants and mechanics. It is estimated that each worker in a woolen mill represents at least seven inhabitants, so that the 16,360 operatives that would be required to supply the people of Canada with woolen clothing represent a population of 114,520, nearly twice that of Quebec, and about equal to the population of Worcester, Mass. This is the actual loss to Canada. The prospective loss from the extinction of the woolen industry is much greater. Canada is in the infancy of her industrial development, and the woolen industry, if properly protected, would increase with the general development of the country. The following extract from an address delivered at Fitchburg, Mass., a few months ago by Hon. W. H. Montague shows not only that Canada has a great future, but that her people know it.

There are nearly four million square miles of territory, one-third of the British Empire, a territory larger than your own. Institutions as free as any under which men live today. A system of education which prepares alike the poor and the rich for the duties of citizenship and the occupations of life. Minerals in abundance; 100,000 square miles of coal yet untouched, in addition to our present areas which are being operated. Gold in almost every province, our production last year being second among the nations to that of your country and Australia. Nickel, admittedly the richest deposits that are known. Timber, majestic forests that yielded in 1903 a harvest of $80,000,000. In pulp now alone our statisticians estimate that we have sufficient to make 4,500,000,000 tons of pulp, which, at the present rate of consumption of the United States and Great Britain could supply them for half a thousand years. We are now sending you 1,000,000 cords per year, but we are strongly inclined to adopt such a policy as shall manufacture this at home by the labor of our own people. Agricultural lands! There lies an empire in itself—265,000,000 acres yet to be ploughed, each acre rich with the accumulated fertility of the centuries. Fisheries of coast and river and lake that yielded last year over $35,000,000 of a treasure, and that offered the very best training and recruiting ground of the navy. Almost countless water powers that are being harnessed as the servants and handmaidens of an industry. Nineteen thousand miles of railway, with probably eleven thousand miles more to follow within the coming decade. Six millions of people, hardy, intelligent, God-fearing. A climate that produces strong muscle and healthy brains, and that makes the home life, the main foundation of any nation, vigorous, strong and pure.

These, sir, are our possessions! These are the possessions that lie at the bottom of our determination to build a nation.

This picture held up before the Fitchburg audience is not overdrawn. Canada has a population of 6,000,000, which before the end of the century may number 50,000,000, and it is on that basis that the loss by the destruction of the Canadian woolen industry should be estimated. For 6,000,000, a woolen industry supporting 114,520 people is required; for 50,000,000 an industry supporting a million, twice the number that now people the whole of Nova Scotia.

Sooner or later the loss of the woolen industry under a low tariff will be realized by Canada. Her people will find that farming it for the rest of the world does not give the necessary scope for their energies and talents. In the meantime the United States can draw an instructive moral from Canada's neglect of one of the primary industries of mankind—textile manufacturing.

The Baling of Cotton.

The report by Robert P. Skinner, American Consul at Marseilles, on baling Indian cotton, published in our March issue has led us to secure data from a number of American mills regarding the Egyptian and American bales. Because of the unavoidable open spaces between the bales the density of cotton compressed in a single bale is greater than the average density of a number of bales packed together. According to the report by Consul Skinner, the density of Indian cotton in the single package is 36.7 pounds per cubic foot for the Bombay bale, and 41.8 pounds per cubic foot for a new bale recently placed on the market.

The tests made for us in several Massachusetts mills gave the following results for single bales:

1 bale Egyptian, 821 lbs.
Size, 22" × 31" × 51".
Contents, 20.32 cu. ft.
Density, 40.4 lbs. per cu. ft.

4 bales American, representing light, heavy and average bales.

1.381 lbs. 12.3 lbs. per cu. ft.
2.453 lbs. 14.8 lbs. per cu. ft.
3.475 lbs. 18 lbs. per cu. ft.
4.507 lbs. 14.2 lbs. per cu. ft.

These tests show that the density of single bales of American cotton is about one-third that of either Indian or Egyptian.

According to the Marseilles consular report the custom in shipping Indian cotton is to make an arbitrary allowance of 40 cubic feet per ton. A test showed that 50 bales occupied a space of 684 cubic feet, equal to an average density of 29.8 lbs per cubic foot in the pile.

The tests of Egyptian and American cotton made for us in the Massachusetts mills gave the following results:

Egyptian:

12 bales, 9,069 lbs., 33.3 lbs. per cu. ft.
20 bales, 14,937 lbs., 32.9 lbs. per cu. ft.
50 bales, 40,000 lbs., 30.5 lbs. per cu. ft.
100 bales, 76,809 lbs., 30.7 lbs. per cu. ft.
48 bales, 38,496 lbs., 29.6 lbs. per cu. ft.

American:

100 bales, 53,500 lbs., 14.6 lbs. per cu. ft.
172 bales, 88,752 lbs., 15.4 lbs. per cu. ft.
100 bales, 52,434 lbs., 12.9 lbs. per cu. ft.
50 bales, 26,300 lbs., 12.0 lbs. per cu. ft.
50 bales, 26,316 lbs., 17.1 lbs. per cu. ft.

A comparison of the figures shows the waste of space caused by the present methods of baling American cotton. In addition there is the damage to the cotton resulting from the soft bales, together with the increased risk of fire and the higher cost of transportation. All these defects of the American bale are made possible by the fact that the United States has a practical monopoly of the production of raw cotton.

A Sign of Prosperity.

During the eight months ending February, 1905, more wool was imported into the United States than for the corresponding period of any year since the free wool Cleveland tariff brought the business interests of the United States to the verge of ruin. The accompanying table shows that the heaviest imports of wool were in 1897, the amount then being 367,000,000 pounds. Under the Dingley law, by which American industries were protected, imports fell to 77,000,000 pounds in 1899, since which year they have shown a steady increase, a reflection of the prosperity and increased purchasing power of the people. In 1897 wool was imported in an unprecedented quantity under a low tariff which impoverished the country. Today wool is imported in large quantity, subject to a heavy duty, because the people are prosperous and can pay the price. During the eight months ending last February the wool imports amounted to 138,516,117 pounds, or at the rate of 207,774,176 pounds a year. The imports for the eight months ending February, 1905, are classified and compared with the corresponding period of 1904 as follows:

	1904.			1905.		
	Quantity, lbs.	Price.	Value.	Quantity, lbs.	Price.	Value.
Class 1	13,496,606	19.5	$2,660,367	43,061,991	22.1	$9,743,601
Class 2	7,482,048	22.	1,647,324	20,669,799	24.1	5,053,940
Class 3	76,911,522	11.7	9,013,807	73,584,327	13.1	9,700,946
Total	97,890,176	13.6	$13,321,498	138,516,117	17.7	$24,498,487

The price per pound shows an increase for each class. The decrease in the quantity of carpet wool does not confirm the general impression that the use of this grade of wool for clothing purposes is increasing.

Wool and Shoddy.

Wool occupies a unique position among textiles by reason of the extent to which it can be reworked into raw material, commonly called shoddy, for the manufacture of new goods. This makes a shortage of the wool supply of comparatively trifling importance because the gap is filled by the use of shoddy, of which the supply is practically inexhaustible. According to recently compiled statistics there has been a marked decrease in the consumption of new wool in Great Britain. The per capita consumption from 1890 to 1894 was 16.35 pounds, rising to 17.13 pounds for 1895 to 1899, and then dropping to 15.73

EXPORTS AND IMPORTS OF RAW WOOL, YARN AND WASTE.

Lbs. in units of one million. Value in units of $'00,000.

Year Ending June 30.	Exports.		Imports.					
	Wool.		Wool.		Shoddy, noils, etc.		Yarn.	
	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.	Lbs.	Value.
1890	.231	.335	106.8	152.6	5.0	20.5	3.5	19.9
1891	.291	.394	129.3	182.4	1.2	4.3	2.0	11.9
1892	.202	.306	148.7	196.9	.3	.9	1.3	7.5
1893	.091	.148	172.4	210.6	.3	1.1	1.2	6.9
1894	.520	.906	55.2	61.1	.1	.5	.5	3.6
1895	4.289	4.844	192.8	229.9	14.1	19.8	2.4	11.7
1896	6.945	8.559	228.4	315.0	18.7	26.5	2.0	10.5
1897	5.271	6.199	366.6	567.5	49.9	69.3	1.8	9.6
1898	.121	.180	132.8	167.8	3.3	6.9	.3	1.9
1899	1.668	2.373	76.7	83.2	.3	.7	.2	1.1
1900	2.200	3.872	155.9	202.6	.4	.9	.2	1.3
1901	.200	.240	104.0	125.2	.6	1.8	.2	1.5
1902	.128	.133	166.2	177.1	.2	.6	.4	1.9
1903	.518	.718	177.1	221.5	.3	.9	.3	1.9
1904	.319	.371	173.7	248.1	.2	.5	.1	1.1

INSERT—Wool Yarn and Wash Table.

pounds for 1900 to 1904. This decline is ascribed to the draughts in Australia which have during recent years caused a marked shortage in the supply and a rise in prices. The English estimate, which is quoted in a consular report from Nottingham, places the consumption of wool and shoddy in the British Islands as follows:

	Wool.	Shoddy.
1900.....	524,000,000 lbs.	130,000,000 lbs.
1904.....	466,900,000 "	180,000,000 "

These figures do not represent the actual consumption of wool and shoddy by the British people, as a large proportion of the woolen goods manufactured there is exported. For this reason the statistics afford a good index of the general ratio of consumption throughout the world.

The same authority marks a decrease in the consumption of home-grown (British) wool from 150,400,000 lbs. in 1870 to 94,100,000 lbs. in 1904. During practically the same period the foreign wool used in British mills increased from 191,200,000 lbs. in 1870 to 423,400,000 lbs. in 1901.

Foreign Trade in Cotton Goods

The Bureau of Statistics at Washington has prepared a very interesting statement of the foreign trade in cotton manufactures of the principal countries of the world. The exports of cotton goods are classified as follows:

EXPORTS OF COTTON GOODS.

Great Britain	$358,231,500	54.86 per cent.
Germany	79,524,100	12.19 per cent.
France	34,693,700	5.31 per cent.
British East Indies	33,976,000	5.20 per cent.
Switzerland	33,891,000	5.19 per cent.
United States	22,403,700	3.43 per cent.
Holland	21,113,000	3.24 per cent.
Japan	20,223,600	3.10 per cent.
Italy	16,824,200	2.58 per cent.
Russia	9,348,400	1.43 per cent.
Belgium	8,831,700	1.35 per cent.
Spain	6,088,000	.93 per cent.
Austria	5,944,900	.91 per cent.
Portugal	745,600	.11 per cent.
Canada	569,300	.09 per cent.
Norway and Sweden ..	465,500	.07 per cent.
All other	59,800	.01 per cent.
	$652,934,000	100.00 per cent.

FIG. 1.

The share of each country in the export trade is shown in graphic form at Fig. 1, and

to afford easy comparison between English speaking countries (including their colonies) and the rest of the world the former are brought together. With the exception of Holland practically all of the exports represented by these figures consist in each case of domestic manufactures. Great Britain is far in the lead with more than half of the total export trade of the world. Great Britain and her colonies supply over 60 per cent. of the whole, while the remaining 40 per cent. is supplied by thirteen countries, of which Germany stands well in advance with 12.19 per cent., while the United States with 3.43 per cent. is among those who "also ran." These figures are taken from the returns for 1902 and 1903, and while, as in the case of the United States, the 1904 exports of some countries may show a marked change, they afford a fair basis for comparison. Classified by grand divisions the exports are as follows:

Europe	$575,761,400	88.2 per cent.
Asia	54,199,600	8.3 per cent.
North America	22,973,000	3.5 per cent.
	$652,934,000	100.0 per cent.

The total imports of cotton goods included in the statement issued by the Bureau of Statistics, amount to $625,625,100. The discrepancy between the exports and imports is due to the fact that they have in some cases been taken for different years, also to the unavoidable variations in the reports. Classified by countries the import trade is as follows:

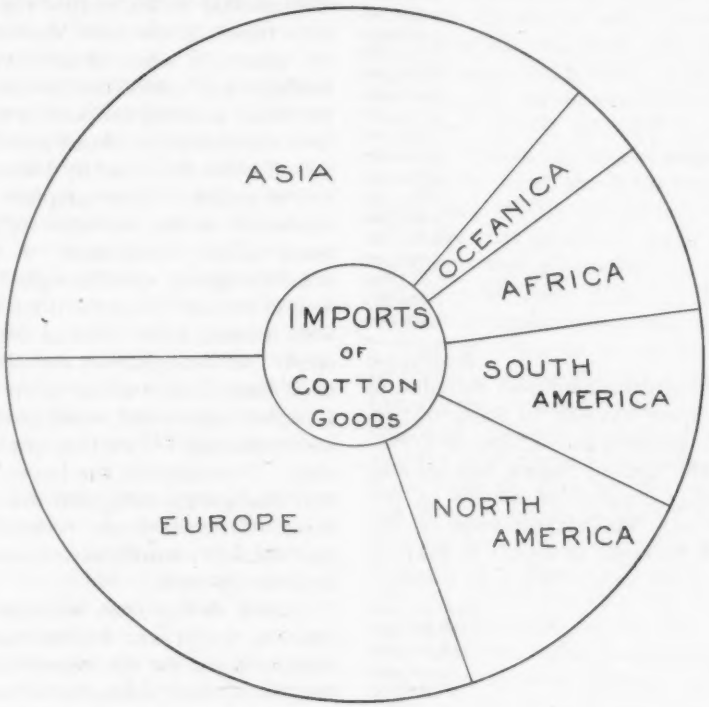


FIG. 2.

IMPORTS OF COTTON GOODS.

British India	$100,609,000
China	83,088,500
United States	49,524,200
Great Britain	35,903,000
Turkey	26,725,600
Germany	22,926,700
Holland	21,195,000
Argentina	20,114,100
Australia and New Zealand	17,329,600
Brazil	15,603,800
Dutch East Indies	15,117,200
Egypt	13,061,800
France	12,073,000
Other British Africa	11,014,600
Switzerland	10,271,000
Roumania	9,956,400
Canada	9,555,200
Straits Settlements	9,488,300
Austria	8,794,000
Algeria and Tunis	8,749,200

Cape of Good Hope	8,533,700
Colombia and Venezuela	8,259,600
Chile	7,782,400
Russia	7,407,500
Belgium	6,836,700
Madagascar and other French Colonies	6,464,300
Norway and Sweden	6,283,400
Cuba	6,275,200
Japan	5,995,100
Mexico	5,422,900
Philippines	4,904,200
French China	4,291,600
Italy	4,110,600
Bolivia	4,007,000
Central America	3,810,600
Denmark	3,974,400
Bulgaria	3,411,000
Siam	3,312,300
Portugal	3,259,300
British West Indies	3,208,600
Corea	2,879,200
Uruguay	2,873,500
German Africa	2,393,300
Spain	2,199,200
Ceylon	2,058,900
Servia	1,615,000
Greece	1,464,500
All other	1,490,900
	$625,625,100

The imports into the countries included in the British Empire amount to $210,762,700, which with the imports into China, $83,088,500, and into the United States, $49,524,200, account for $343,375,400, or nearly 55 per cent. of the total. The classification of imports by grand divisions is shown in graphic form at Fig. 2, the values being as follows:

Asia	$227,640,000
Europe	188,586,200
North America	78,169,600
Africa	50,216,900
South America	58,778,600
Oceanica	22,233,800
	$625,625,100

Black Cheviots for the Japanese.

We have received a sample of the black piece dyed cheviot cloth now being made in large quantities by a Scotch firm, Brown Bros., of Galashiels, for clothing the Japanese troops. It is a very strong all wool fabric, woven with a plain weave and weighs 30 1/2 ounces per yard, 55 inches wide. It is impossible to determine beyond a doubt which is the warp in the sample we have. There are 36 threads one way, and 34 the other, the average size of the yarn as it lies in the finished cloth being 1 1/4 runs. The warp and filling are twisted in opposite directions. The cloth is very strong, and is remarkably soft and pliable, especially in view of the fact that it is woven plain.

Justice for Textile Manufacturers.

A recent decision of the New York courts in the case of Howell v. Markowitz is of special interest to the textile trade. According to a report of the case Markowitz purchased six pieces of white broadcloth from the defendants and a month after the delivery of the purchase notified the sellers that the goods, with the exception of one piece, which was retained, were reported by his sponger as inferior in quality to the sample. Howell & Co., confident of the condition of the goods, refused to take them back. A few days afterward the goods were brought back to the sellers' store and left at the door by the sponger who hurried away without waiting for a receipt. An examination showed that they had been badly soiled while in the buyer's or his sponger's hands and would have to be cleaned and refinished before they could be made salable. Consequently the buyer was notified to take the goods away and make payment for them. This the buyer refused to do, saying that the seller would have to settle the matter with the sponger.

Howell & Co. then brought suit. At the trial the buyer and his sponger were called upon to point out the imperfections for which they based their claim, but were unable to do so. Their testimony was contradicted by a number of reputable witnesses. A verdict for the full amount and costs was rendered and the amount has been paid by the defendant. The result is a salutary lesson for the buyer in question and should serve as a warning to the large number of traders who look upon a textile manufacturer as one having no redress against the abuses that are practiced on the marketing of his products.

In 1903 there were 15,100,000 cotton spindles in the Northern states and 6,900,000 in the Southern states. The annual consumption of cotton in bales of 500 pounds each was 1,980,000 for the Northern states and 1,910,000 for the Southern.

FOREIGN TRADE.

March 16, 1905.

Editor Textile World Record:

On page 64 of the March number of the Textile World Record, under the heading of "British Exports of Textiles," you point out an excess of imports into England over exports of $1,217,644,943, which you say must be paid for in cash, or charged against principal and interest of the debt due Great Britain from foreign countries.

Now without any reference to the particular item in question, it seems to me that assumptions of this kind are always misleading and nearly always wrong. You assume that all this difference is, we will say, charged against the debt due Great Britain by foreign countries; this would make the English nation just that much poorer, whereas on the face of it the English nation has received in the year, just that much more wealth than what it has sent out, and it does not necessarily follow that in addition to the wealth in goods which they have paid out, that they would have to pay out any bullion, or cancel any credits.

To illustrate my meaning I would assume the following case: A London merchant charters a vessel and loads her with farming implements to the value of $50,000, cost F. O. B. London. He sends that cargo to Buenos Ayres, where he sells it at a profit sufficiently great to pay the cost of the transport and other charges, and to make $10,000 profit. The capital in the venture being now increased to $60,000 free money, he buys hides with this money and ships them to Boston where he sells them at a price which not only pays him the cost of the transport and other charges, but realizes him the equivalent of $10,000 profit on the sale, so that he has now increased his net capital to $70.000. This money he invests in cotton goods in Boston and ships them to Canton, where on arrival he disposes of them for a price which gives him over and above the cost of transport and charges, a net profit of $10,000, increasing his capital now to $80,000. This money he invests in tea at Canton and ships same to New York, where on arrival a net profit of the equivalent of another $10,000 is realized, increasing his funds to $90,000. At this juncture $90,000 value is invested in hardware specialties and is shipped to London, where on arrival the goods are sold at a price which pays the transport and charges thither, and realizes $10,000 above this at the prices obtainable on the London market for the goods. His capital is now $100,000.

Now the statistics in the case would show exports of hardware, $50,000, and imports of hardware $100,000, and according to such inferences as you draw, the country would have to send out $50,000 in bullion to offset the difference as shown by the statistics.

Instead of this you will observe that the country is richer in this instance by the exact amount by which the imports exceed the exports, and this is the ordinary and natural inference that would be made from the bare statement that a man had taken in during a certain year more than he had paid out, whether it applied to money or goods.

Another thing to be considered is that no inferences can be correct when made on returns from isolated trades, which can be illustrated from the example just cited by assuming that, instead of loading hardware in New York for London, the money had been put into dry goods specialties and shipped to London and sold at the same profit. The result in this instance would add by that amount to the report of the textile imports, and it would look on the face of such statistics as if the balance of trade on hardware was going in favor of Great Britain, while the balance of trade in textiles was going against her, but whichever way the transaction was made, the country would still be that $50,000 richer.

To put it plainly, the great bulk of the newspaper deductions, made from a casual observation of statistics on balances of trade, etc., are rubbish pure and simple, and to get any information really worth while from such figures it requires that all of the complex currents of the trade, from which only the balances are shown in the statistics, should be before the writer and sifted and subjected to a most careful analysis, though very few people have either the time, patience, general knowledge, training or ability to do this, and very seldom can they have access to all the necessary information.

While I cannot refer to any particular statistics, yet my impression is that a review of Great Britain's trade balances over a long period of years would show that they nearly always import a great many more goods than they export, and this to such an extent that it would have been impossible to pay in bullion or securities without bankrupting the country and making it impossible for them to buy anything, and yet all the time the kingdom has kept on getting richer and richer.

The real fact is that every transaction presupposes two profits, one to the buyer and one to the seller, and this from the fact that goods are usually always taken from the place where they are worth least to the place where they are worth most, and that is where the profit, less the cost of doing the business, comes in.

Goods that a mill sells at 75c. a yard sell over the retail counter in the same town at $1.00 a yard. This, after the expenses of doing the business are paid, leaves a reasonable profit. At the 75c. price the mill in turn should have made a profit also, so that if the mill made a 10 per cent. net profit on the transaction, and the retailer got 10 per cent. net, it follows that two profits of that amount, equal to 20 per cent. have been made on the same lot of goods and in the same community. Exactly the same thing applies to foreign trade.

The tea that sells in Canton at 40c. a pound is worth in London 40c. a pound plus cost of transportation and charges, plus profit. It is the business of a great trading nation like England to take goods made by her manufacturers to the places where they will command the most money, and in turn to bring to her own ports those commodities that are worth more in her ports than they are in the ports of shipment. Thus, if a country is in a healthy way at all, the imports of goods must be more than the exports. If the imports exactly equaled the exports, the inference would be that the country was doing business at a loss, that loss being measured by just what it costs to transport and handle the goods. Carrying Trade.

The variation in the price of print cloths in the last 40 years has ranged from 38 1/2 cents in 1864 to 1 7/8 cents in 1898.

THE PESO.

With the introduction of a new system of currency into the Philippines last year, based on a peso (12.9 grains gold) equal to 50 cents of United States currency, it became necessary to adopt some sign to distinguish the peso from the United States, Mexican and Spanish money. The reports coming from the Islands from time to time were often confusing, and it was necessary to state with almost every sum expressed in the reports whether it was in United States, Mexican or local currency. When the new currency system was about to be inaugurated, the confusion would have been worse by adding still another kind of money. The necessity for some sign was so evident that the Bureau of Insular Affairs devised the peso mark, which has been quickly adopted in insular and foreign trade.

This sign, consisting of two parallel and horizontal lines crossing the upper part of the letter P, was selected because the letter P is the initial letter of the word Philippines, the initial letter of the word peso, and the initial letter of the Spanish word plata, meaning silver, the metal of which the new coins were to be made. As the dollar mark, $, had horizontal lines superimposed upon the letter S, the two parallel lines were run through the loop of the letter P so as to show by analogy that it was, like the dollar mark, a sign of value.

After the sign had been decided upon by the chief of the Bureau of Insular Affairs, a cable was sent to Manila describing the mark, which was immediately accepted and adopted by the Insular Government, and now as Mexican and local currency are no longer legal tender, when the dollar mark, $, is used in connection with any sum of figures, it is recognized at a glance that gold, or its equivalent in United States currency is meant. When the peso mark is employed it is known at once that Philippine currency is meant. As one dollar is equivalent to two pesos, or two pesos equal to one dollar, all accounts can now be expressed with these two signs, and they bear the invariable ratio of two to one.

The adoption of the mark has been a great convenience in the Philippines, and it

is to be hoped that as other silver using countries adopt the gold standard, but use silver as a circulating medium, similiar to the system now in force in the Philippines, the same mark may be adopted by them.

BALING COTTON.

Boston, Mass. March 18, 1905.

Editor Textile World Record:

In your last issue there is a letter from our consul at Marseilles, France, dated February 7, regarding the baling of Indian and Egyptian cotton. He is right in his statements. I beg to add that any one can have his cotton pressed in India as well as in China or Egypt by paying the regular fees, which are very low. As Mr. Skinner says, these goods are all bought in bags and then pressed in large public presses.

Regarding such a procedure not being feasible in America, I would say that our large and small farmers in the South have nothing to do with the pressing of their cotton. The seed cotton is brought in from the farm on a wagon to the gin, there ginned and pressed in what is called an uncompressed cotton bale. This cotton is shipped by rail to the first public compress where it is repressed by a strong hydraulic press, which presses the bale to a density of 22 1/2 pounds per cubic foot. When the American bale leaves this press it is in very good shape and generally not more than one foot thick; often it is thinner.

The trouble is caused by the shape of our bale. If we made a bale of the proper proportions as in India and Egypt, it would retain its shape better and as a matter of course would lose less and be in better condition. The reason for this is evident when one considers the expansive force of baled cotton and of, say, compressed air. When air is compressed it exerts an equal pressure outward in every direction. On the other hand when cotton is compressed into the press box by the perpendicular plunger, the expansive force of the material is exerted only against the plunger and the bottom of the press. As a consequence the smaller the surface of the plunger, the less tendency will there be for the bale to bulge after it comes from the press.

After the American bale is compressed it is too broad for its thickness, and gives too large a surface over which the cotton bulges. The Indian and Egyptian bales are thicker than they are broad, consequently the bulging surface is much less than with the American bale. To improve the condition of the American bale the gin press should be narrower and about one-half foot shorter, and the bale about a foot thicker. When run through the compress it would in this way make a very compact bale, easy to handle and one that practically could not lose its shape. Most of our presses are very powerful machines. The trouble with the American bale is not caused by a lack of power, but by a wrong application of it.

I have had considerable experience in handling Shanghai, Bombay and Egyptian bales. I have also spent much time in the South. All complaints about the different presses are useless until the press boxes of the presses in the country are changed. In India where they make the long Indian bale measuring 4.16 feet, they have tried to reduce it to 3.08 feet and the width from 1.44 feet to 1.27 feet, and increase the thickness or height from 1.80 to 2.42 feet. This is more on the order of the Egyptian bale and confirms my conclusions as to bailing cotton. A broad bale bulges too much and is, therefore, not likely to stay in good shape. The narrower the bale the less chance for bulging and the better will be the condition in which the cotton arrives in the market. As far as humidity is concerned American cotton can stand as much pressure as China or India cotton.

The freight on India cotton is approximately 15 shillings, and it generally consumes less time in transit than from our Southern ports, because most of the Indian lines have fast boats. The time required from Bombay to the Continent, ranges from 14 to 18 days. The freight from Galveston and New Orleans to Europe on cotton is all the way from 27 to 40 shillings and the steamers take from 20 to 25 days. I believe if the American cotton presses were changed to make a bale of the proper dimensions, the

annual saving of freight alone would be equal to 50 per cent. of the cost of the change. In addition there would be the still greater saving in cotton, greater convenience in handling and less damage to the vessels now caused by the screwing of the cotton.

ADOLF LEVE,
Boston Manager, W. Wolf & Sons.

THE ARTIFICIAL SILK INDUSTRY.

The remarkable growth of a new industry, the manufacture of artificial silk, for which the first mill was started only fifteen years ago, is described by the Monde Economique, which gives the following list of artificial silk mills in operation or projected at the present time:

Year.	Capital, francs.	Shares	Value per share, francs.	Name of Company.	Production, actual lbs.	Projected lbs.
1890	2,000,000	16,000	125	Societe Bisontine de soie Chardonnet	3,300	2,640
"	1,000,000	20.000	50	Societe de Tubize, Chardonnet system	3,500	880
"	—	—	—	" " branch	—	—
1903	1,500 000	15,000	100	Artificial silk of Givet	440	660
"	5,000,000	15,000	100	Frankfort-on-the-Main, four factories	4,400	1,100
"	—	—	—	Glanzstoff and Elberfeld	1,100	660
1904	2,200,000	4,400	500	French Society of Viscose		1,100
"	4,240,000	32,000	132½	Hungarian, Branch of Bisontine		1,100
"	3,000,000	30,000	100	American " "		—
"	3,000,000	30,000	100	Italian " "		1,100
"	4,000,000	30,000	100	Russian " "		1,100
"	1,000,000	4,000	250	Obourg, Belgium,		1,100
"	1,000,000	4,000	250	Nivonne		1,100
"	2.500,000	10,000	250	J. D. Ramel		1,100
"	5,000,000	50,000	100	Russian Society, Branch of Tubize		1,100
"	2,000,000	20,000	100	Beaulieu		1,100
"	1,500,000	15,000	100	Valette, Lyon		1,100
"	1,500,000	15,000	—	" Branch		—
"	2,000,000	20,000	100	Izieux, Branch of Givet		1,100
"	2,000,000	20,000	—	" Branch		—
"	800,000	8,000	100	Lyon, Branch of Lumiere		1,100
"	800,000	8,000	—	" Branch		—
"	800,000	8,000	—	M. Tetley, England		1,100
	41,740,000				12,740	20,240

According to this exhibit the present annual production of artificial silk amounts to 3,762,000 pounds, equal to one-fourteenth of the total production of natural silk. The projected mills are expected to raise the annual rate of production to 10,817,400 pounds, by the end of 1905. This estimate, however, must be accepted with a considerable discount for unforeseen contingencies, which are specially likely to arise in the development of a new industry like the manufacture of artificial silk. The first mill founded in 1890 at Besancon by M. Chardonnet, the inventor of the process, was unprofitable for several years and after various reorganizations was finally assisted by the inventor's contribution of a part of the income from royalties which he had reserved for himself. Up to the end of 1892 the losses had amounted to $125,000, which was increased by an additional deficit of $37,000 in 1893. The stockholders were induced to persist in the enterprise by the fact that the losses were growing smaller, due to a steady decrease in the cost of production and an increase in the selling price. In 1895 the daily production amounted to 330 pounds, which was sold at $2.50 per pound. From this time the business prospered and in 1898 the first distribution of profits was made. The total dividends since paid to the stockholders are reported as follows:

1898	$ 40,349	6¼ per cent.
1899	153,526	6¼ per cent.
1900	00,226	6¼ per cent.
1901	123,690	8¾ per cent.
1902	151,493	15 per cent.
1903	482,175	72½ per cent.

A considerable part of these profits, especially in recent years, consists of income from royalties paid to the parent company by the branches in various countries. The enormous returns of 1903 cannot, therefore, be taken as a basis for the probable profits of the branch mills, which must pay the royal-

ties and depend for dividends on the ordinary profit of manufacturing. The capital stock has a par value of $400,000, but the market value of the shares has been subject to wide and violent fluctuations as shown by the following summary of quotations for the last four years:

	Highest	Lowest
1901	132 (average)	
1902	184	125
1903	960	179
1904	2256	700

At the close of 1904 the stock was selling at 1456, which made the market value of the capital stock equal to $5,824,000.

MEETING OF THE NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION.

The annual meeting of this association will be held in Chipman Hall, Tremont Temple, Boston, on Wednesday and Thursday, April 26 and 27. An interesting program is outlined by Secretary C. J. H. Woodbury and includes papers on the following subjects:

Boiler Houses, Centralization of Power, Cloth Room Equipments, Cotton Manufacturing in Japan, Critical Analysis of the Detaching and Piecing Processes in Combing Machines, Electrical Transmission, Experiments in the Manufacture of Cotton Yarn, Gray Goods for Clay Filled Work, Jamestown Separator, Mill Ventilation and Its Influences, Mote Cleaners for Cards, Motor Drive as Applied to Cotton Mills, New Classification of Color, Relationship Between the Planter and the Manufacturer: Its Unnecessary Antagonisms, Removal of Static Electricity in Spinning, Standard Screws in Cotton Machines, Warp Tying-In Machines.

Advance copies of the papers can be obtained upon request to the Secretary, who urges all who may be unable to attend the meeting to take part in the discussion by submitting written statements.

Hon. Louis A. Frothingham, Speaker of the Massachusetts House of Representatives, will welcome the Association and extend the greetings of the Commonwealth, on behalf of His Excellency, Governor Douglas, who will be unable to attend the meeting.

BURNING ACCIDENTS FROM THE USE OF FLANNELETTES.

Many accidents in England, resulting fatally or in shocking injuries have been due to the inflammable character of flannelette, the use of which is increasing in the United States. A surgeon recently wrote on this subject to the "Lancet" as follows:—

"There are three kinds of flannelette—the ordinary, which is highly inflammable, but not more so, it seems to me, than other cotton fabrics; a variety which has been treated with some preparation which greatly reduces the flammability till the material is washed, when the virtue is lost; and a kind called 'non-flam,' which is said to be free from this defect. I send you a specimen of 'non-flam' flannelette as bought, and a piece of the same that has been washed twelve times; you will see that the claim does not appear to be fully borne out. For the prevention of these sad burns (referred to in "The Lancet" of January 21st, 1905) the following precautions suggest themselves. 1. The use of fireguards. Everyone approves of these, but it must be remembered that in most English homes the day nursery and the kitchen are one and the same room; therefore, the fireguard must be movable. Perhaps the London County Council in the next block of workmen's dwellings it erects will set a good example by providing the kitchen fireplaces with swinging fireguards. 2. The prohibition of the sale of ordinary flannelette. This would not be much good, for the poor can afford neither flannel nor the 'non flam' varieties of flannelette. The latter cost about 14 cents a yard, as against 5 1/2 cents for the ordinary variety, which can be made, it is said, non-flammable by soaking in alum after each washing. 3. The use of sleeping sacks with arms and a button at the neck, instead of a nightdress. The child could not walk about in a sack, and therefore could not get to a fire and ignite its clothes, for it would be naked. In a recent case the child got up, took some matches, and set its nightdress alight, as the child herself said before she died. One defect of ordinary night-

dresses is that a restless child kicks off the bedclothes and rolls up the nightdress under its arms, leaving its legs and half its body exposed."

In commenting on this letter the Lancet says:—

"We have made some tests with the samples which our correspondent has kindly forwarded to us. There is little doubt that the inflammability of the flannelette known as 'non-flam' is practically nil. After several washings with soap and water, however, there is a tendency of the fabric to regain some of its original inflammable property; but even then this is nothing like so marked as in the untreated flannelette. This behavior implies that the inflammable flannelette is rendered much less inflammable by treatment with a salt of some kind which after repeated washing of the material is to a large extent removed from it. 'Non-flam,' at any rate, is loaded with mineral matter, and according to our experiments this consists largely of a tin salt. We have also received a specimen of the 'non-flam' material from the manufacturers, which proved to be identical with the piece sent to us by our correspondent. The same correspondent in a further letter points out that in the two recent cases of burning alleged to be due to the use of flannelette the material in the first was a flannelette nightdress, and the accident occurred at 9.45 a. m. not p. m. In the second case the child was dressed in flannel and not flannelette, the coroner eliciting from the mother that she had dressed the child in flannel since an attack of bronchitis. The suggestion of our correspondent in favor of the adoption of swinging fireguards seems to us therefore a valuable one, and there is much to be said also for the proposal to substitute for the ordinary nightdress for infants a sleeping sack which would prevent the child getting close to the fire. Many children of the poor are probably allowed to play in their nightdresses for the greater part of the day. The fireguard would seem, therefore, to be the only effectual and practicable remedy against these sad occurrences, and we think that the purchasers of flannelette and other inflammable wearing material should be warned about its dangers, so that they may take every precaution to prevent the poor little irresponsible infants from exposing their dresses to the risk of ignition."

EDUCATIONAL JEALOUSY.

The Saxon Minister of the Interior recently informed the Saxon Chamber of Commerce that he had received a communication from the Austrian minister to the effect that a professor of the Royal Technical School of Austria was about to be sent abroad by the Austrian government in order to obtain information regarding the best methods of technical instruction and that he would like to inspect the textile schools at Zittau and Chemnitz. The Saxon minister asked the Chamber of Commerce if there were any objections to such a visit of inspection by the Austrian, and if so to state them in detail, particularly keeping in view the interests of the home industry.

The Chamber of Commerce at Chemnitz replied that after consulting with the professors of the Chemnitz Textile School it was found to be the unanimous opinion that the interests of the home industry required that the Austrian gentleman should not get a glimpse of the conditions existing in the German schools. They stated that the information thus obtained would be to the advantage of Austria and to the injury of the German industry. Austria had made remarkable progress in the manufacture of carpets and upholstery goods, also to a less extent in the production of knit goods, and was now competing sharply with Germany, especially in the Orient. It was therefore extremely hazardous to take any action that would strengthen the Austrian competition. It was the opinion of the Chemnitz professors that German interests would be seriously injured by such a course. The managers of the German schools occupy an excellent position for judging as to what methods adopted in their schools should be kept from foreign observers.—(Leipziger Monatschrift fuer Textil-Industrie.)

Dyestuffs in ordinary use may be divided into basic, resorcine, acid, azo, mordant, sulphur, and natural.

THE TEXTILE FIBRES OF PARAGUAY.

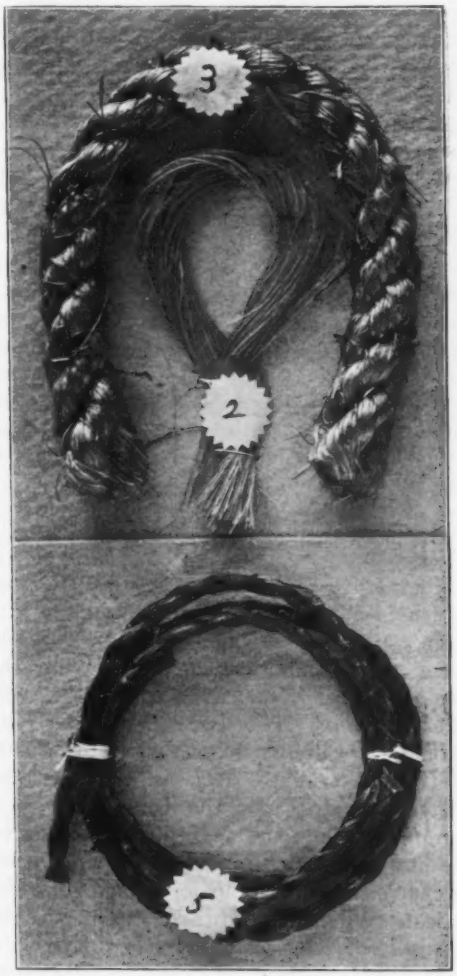
BY E. L. RUFFIN.

The textile plants of Paraguay promise large profits to one investing in their production, either for home consumption or for exportation. One company was established for this purpose, but failed, I am informed, by reason of inexperienced hands and the lack of transportable machinery. This second point is most important, as there is a scarcity of labor, owing to the enormous losses of the population during the years when the country was at war against a triple alliance formed of the Brazilian Empire and the Argentine and the Uruguayan republics. The country is rapidly recovering, however, both in population and in industrial activity.

FIG. 1.

CARAGUATA.

Caraguata, Fig. 1, is one of the most important fibres grown in Paraguay, by reason of its great abundance, as well as its adaptability for making rope, etc. The natives put the leaves in water so that the fleshy vegetable part rots leaving the fibre, which is taken out and beaten once or twice to remove any particles that may adhere thereto. There are no large cultivated plantations in one place to warrant stationary machinery. If proper, transportable machines capable of being taken from hill to hill and along the valleys and sides of rivulets, on donkey or mule back, could be obtained, they would very bountifully remunerate the owners. These machines should be of simple construction, costing not more than $250 or $280 with a reasonable discount, and have a capacity of 500 pounds of fibre per day of ten hours. The



quantity mentioned may not be considered profitable for exportation if one machine is taken into consideration, but the idea is to obtain a number of machines to be distributed in different sections, whose aggregate production would be several tons per

day. There is no fear of the sale of the fibre, as it is in large demand here for domestic consumption. The fibre is crudely twisted into rope, which is used in the manufacture of the soles of the native slippers worn by the poorer class of people throughout the country, and are sold for about 20 cents, gold, per pair, also for ropes for other purposes, such as halters for horses. Fig. 2 is a sample of caraguata fibre. Fig. 3 is a sample of caraguata rope made by the natives.

Each caraguata plant, Fig. 1, has a considerable number of leaves which range from 1 1/2 to 5 feet high. The plant flourishes best along that part of Paraguay called Arroyos Esteros, a low part of the country, which seems to be adapted to produce the largest and best plants with the finest leaves. The leaves are cut very near the root from which they spring up again. I believe these places would be most excellent for planting sisal, because of the adaptability of the soil to produce fibrous plants. As the caraguata is cut away, sisal plantations could be started, but it seems to me there is no need of making plantations of these products as there is an almost inexhaustible supply in every part of the country.

IBIRA.

The plant next in importance is ibira. It will be seen from the illustration, Fig. 4, that the leaves are much smaller and not so thick as the caraguata. It appears in the different places where caraguata grows, having the peculiarity that it flourishes best nearest the woody sections. The mode of working ibira is somewhat different from that of caraguata. The natives take the leaf, as shown in the illustration, strip out the centre or stem, thereby dividing the leaf into three parts. The boy in the picture has in his right hand the centre strip and in his left the two sides of the leaf. When stripped the centre is put into the sun to dry, and when dry it is twisted into cords which are used for tying up tobacco in bunches and bales; but its principal use is, I believe, for making hammocks, which are used by the peasants throughout the country.

Fig. 5 is a sample of this cord made by the natives. If this rope could be exported in the same condition as this sample, I believe it could be used in the United States. It would arrive in good condition because it is well dried and conserves its strength. I also believe that ibira could be worked in the United States and made into a beautiful silky fibre. The fibre of ibira, when cleaned of all extraneous matter, becomes exceedingly glossy and could be used in imitation of silk. The natives occasionally clean it for this purpose, and in this development it would play an important part among the higher classes of fibres used in commerce. Perhaps there is machinery that would serve in the extraction

FIG. 4.

of caraguata and ibira, and at the same time be adaptable to the different lengths and widths characteristic of each plant. I am sending you a few leaves of both the caraguata and the ibira for the examination of those who may be interested.

MBOCAYA.

Mbocaya is the Guarini name for the cocoa or palm tree, Fig. 6; I use this name because it is best known as such in the country districts where it abounds. I may here mention that two languages are spoken in Paraguay, about two-thirds of the population speaking only the old Indian language called Guarini, and it is for this reason that most of the plants herein mentioned are called by the

Guarini name. In the cities, and especially in the capital, the predominant language is Spanish.

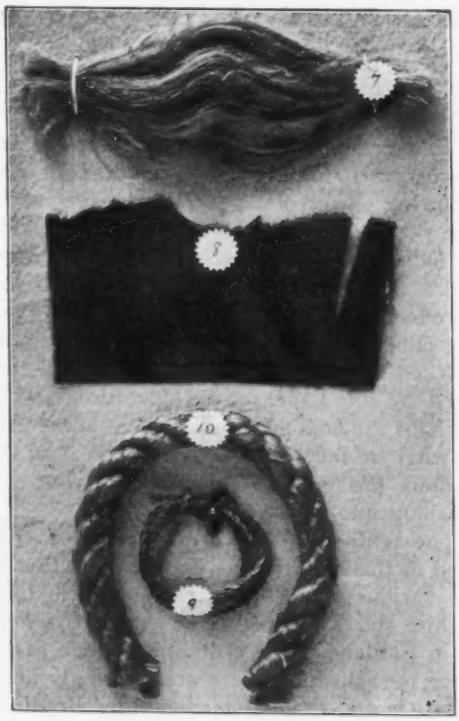
The palm is the most important tree in this country. Its fruit yields an oil rated as the best of palm nut oils. For years the people have been hoping to obtain a machine that would break the nuts of this cocoa without crushing the kernel. This machine should be portable, for the reason that owing to the difficulties of transportation in the outside

FIG. 6.

sections, and the scarcity of labor, it would have to be carried to another place as soon as the nuts were gathered in one locality. Paraguayan nuts are in great demand in England and the United States. These trees are found in great abundance, are very hardy and not subject to damage from insects; they also resist drought well.

The leaves are about two feet long, and the natives use them in their green state for tying up bags of charcoal and for other uses where cord is needed. The fibre, Fig. 7, that is extracted from the leaves is exceedingly fine and soft, of a bright yellow color and somewhat resembling human hair. I see no reason why it could not be used for false hair and wigs, as it could doubtless be dyed any color necessary. Its exceeding fineness is quite apparent in comparison with the other fibre. It would also make an excellent twine.

Aside from the use of the nut for extracting oil and the leaves for fibre, there are in



the centre portion at the top of the tree, other large shaded brown leaves, Fig. 8, which also contain a great quantity of fibre and have the appearance of beaver skin, being covered with soft, silky hair of a very glossy nature. They are about one foot wide and from one to two feet long and are very light in weight. They might be used in the manufacture of hats and for numerous other things.

Yet another thing is to be found in the palm tree. At the top of the tree and in the immediate centre, is a fruit very white and soft. The natives eat it and also extract a kind of wine from it. They leave the fruit on the tree and make an incision therein, leaving a cup to catch the liquid which, I am told, is very refreshing. The operation can be repeated several times.

Fig. 9 is a sample of the twine made from the fibre of the leaves of the mbocaya and gives an idea of its excellent quality. Fig. 10 shows the rope made from mbocaya. I would be glad to have any of your readers inform me what price the broad leaves would bring in the United States.

ORGANIZATION OF THE BRADFORD DRESS GOODS TRADE.

BY ANGLO SAXON.

In the rapid development of trade in this country no single effect is more noticeable than the power of organization displayed by the younger generation of American leaders of industry. This capacity for orderly regulation of production and distribution has had its effect upon the textile industry but not to the same extent as in other fields. It is more marked in the internal working, as was noticed by the Lancashire Deputation, and in perhaps the final distribution to retailers than in what we may call the "assembling" of the various products of spinning, weaving and finishing into a salable whole.

The textile industry is too widely distributed in this country for the specialization of the various processes as carried on in Lancashire and Yorkshire to be as effective here as in England. The economies which result from specialization there are strikingly illustrated in the gradual recovery by Bradford merchants of some of the dress goods trade lost at the passing of the Dingley tariff.

This result has been attained as much by improved methods of organization as by economies in production. It has been secured in many cases, by what seems a paradox, by adding another "middle man." Twenty-five years ago the merchant undertook both to assemble the cloth and to distribute it to the retailers. Today a large amount of this work is divided between two distinct sets of merchants—one assembling and the other distributing.

In former times each of the big Bradford firms had its own staff of drummers covering England and Wales from end to end. Their orders were collected together, if time allowed, and the cloth ordered from the manufacturer. As it was delivered, instructions for dyeing and finishing were given out, and, after much time spent in inspecting deliveries and rejecting pieces for bad coloring, stains, etc., a portion of the order would be delivered to the retailer. Where orders were not of great bulk and represented seasonable goods this system involved much bookkeeping, delay, worry and often loss either to the merchant or more probably to the unfortunate underdog—the dyer.

Within the last few years the assembling merchant has come to the front. In many cases he is also a large manufacturer of some specialty, but there are firms which confine themselves entirely to assembling. The two classes of merchants stand somewhat in the position of central exchanges, one collecting—the other distributing. The assembler taking advantage of some lull in the market may either place a bulk order with a manufacturer for seasonables on standard cloths, leaving it to him to buy the yarns, or he may himself purchase warp and filling and have them woven on commission. A range of suitable colors are dyed and sample cards placed in the hands of the distributing house, and orders on these are booked all over the country.

All that the distributer has to do when his orders dribble in each day is to send across the street for the finished cloth, and ship it, very often the same night. Of course the distributing profits are much more definitely realized by the retailer and it becomes little more than a commission business, but considering the delays and worries of the system it is displacing, it is probably as profitable.

This throws the worry and risk on the assembler, but he is much better able to bear it. As orders are coming to him from different distributers on the same ranges of cloths and colors he can with little risk stock these. He can place orders for larger numbers of pieces to each color with the dyer and secure better terms and also better dyeing and finishing, fewer stains and damages. These combined results effect so many savings that he can probably afford to sell the finished cloth cheaper than the distributer can buy the undyed cloth. If cloth is not in stock he can

usually also have it dyed and delivered before the distributer gets his quotations all in. As far as this system has developed in Bradford it has effected a most marked cheapening of dress goods.

This all seems so obvious and on such common sense lines that it hardly calls for detailed description. It is, however, the "market" system begun sixty or seventy years ago, the biweekly meeting of spinners, weavers, dyers and merchants in Bradford, which has made this more economic production of dress goods possible. It is the remarkable results which have been achieved by this frequent personal intercourse between the different producers which demands recognition. Not only are Bradford goods finding their way in gradually increasing quantities in spite of the high tariff into this country, but the flow of cheap German and French goods into England has been diminished.

Much the same results of personal intercourse are produced on a small scale in large American mills carrying on all processes from the fleece to the finished article when the different overseers meet, but it is evident they cannot command the same capacity for diversifying their products that a Bradford assembler with all the English spinners, weavers and dyers to select from does.

Goods can be designed and produced so rapidly and cheaply under this Bradford system that it is commonly reported that certain linings, just within the limits of weight, picks, etc., as specified in the McKinley tariff, were placed on this market immediately that tariff became law. Nowhere probably in organized industry has specialization been so fully associated as to produce rapidly and cheaply such an enormous variety of products differing in design, color and composition as in the Bradford dress goods trade.

In a treatise on "Female Attire" written in the second century, women are admonished to "employ your hands with wool; keep your feet at home. Thus will you please more than if you were in gold. Clothe yourself with the silk of probity, with the fine linen of sanctity and with the purple of modesty."

COTTON CULTURE IN PORTO RICO.

BY J. FEDERICO LEGRAND, Professor of Botany, University of Porto Rico.

During the great Civil War in the United States, and for a few years thereafter, or from 1862 until about 1869, cotton culture in Porto Rico was in a flourishing condition. On account of this war, the supply of cotton furnished by the Southern states became limited, and caused the rise of a profitable industry in Porto Rico, where large tracts of land were devoted to planting this staple. The amount produced was not scanty, for the trade in this textile remained active for a number of years.

It seems that good results were obtained, because from data that I have been able to gather the production averaged from eight to nine hundred weight per acre, in each of the two crops that were gathered annually. This was especially true of the crops planted on the alluvial plains, which are the most fertile lands on account of the organic substances contained in the soil.

Thousands of acres were under cultivation, not only on the northern and southern coasts, but even in the hilly interior. The culture of cotton gradually fell off, until finally it was completely abandoned. It is somewhat difficult to determine the causes of the decay of this industry, but I am safe in asserting that not one, but several causes combined to bring about the down-fall of this once flourishing product. The development of certain industries depends not only on the needs, but also on the taste of the consumers; and shippers in their turn make certain demands on farmers as to the appearance of raw materials offered in the market. A uniform, even product of good quality will always command a good price, but an article of irregular quality, and hence hard to classify, will fluctuate in value according to its quality and appearance, when offered on the market. This is exactly what happened to Porto Rican cotton.

It is true that there was only one botanical genus, Gossipium, cultivated in Porto Rico, but there were three varieties. Hence, there were three different grades of cotton packed

in a single bale, which when offered on the market, were hard to classify and lowered the demand for Porto Rican cotton. Some farmers raised a species of cotton of African origin, resembling somewhat the Egyptian cotton, but a little coarser and of a woolly appearance. Another variety was slightly yellowish in color, but had a strong soft fibre; while still another variety was the native cotton of tropical America, which is very common and grows almost anywhere on tall spreading bushes, and gave large crops. At the present time, the last named species still exists in a degenerate state, due to lack of proper cultivation. At that time it furnished a large part of the product for export; but, in a word, Porto Rico had not a fixed staple to offer in the market. With the close of the Civil War cotton growing was again built up in the United States, with a corresponding decrease in price and production in the West Indies.

As Porto Rico belonged to Spain, her trade relations were not sufficiently favorable with foreign countries to compete in the markets of the world, with the great cotton producing area of the United States, and, consequently, cotton growing was in due time, completely abandoned; and farmers and merchants, who had large sums of money invested in machinery and warehouses, suffered severe financial losses, and a general disaster seemed to sweep over the country. Since then no one thought of trying cotton raising again as this crop was considered of little or no value for increasing the general wealth of the Island.

The writer of this article never agreed with this opinion, and considered the reasons given for abandoning the raising of cotton, as absurd. About ten years ago he wrote a book on Porto Rican products and then recommended to Spanish and Porto Rican planters, the cultivation of Sea Island cotton, as a means of increasing the general wealth of the country.

This recommendation was made repeatedly in the Island press, but this propaganda did not receive any attention until after the American occupation. But today, with the valuable aid of new elements, it can be said that a work begun years ago in favor of our native island, has not been in vain, and we may hope that the fertile soil of Porto Rico properly and intelligently cultivated will give paying returns.

No country in the world is better adapted for cotton growing.

The kind of cotton raised at present is the best to be found for the market, namely the celebrated Sea Island cotton, which for the glory of Porto Rico, and the corroboration of what has been said by the writer, received the grand prize in the Louisiana State Purchase Exposition held in St. Louis.

In addition to a favorable climate, Porto Rico possesses all the other qualifications for successful cotton raising provided, of course, that proper care is given to its cultivation. It is certain that excellent results would be obtained by planting the fine species of cotton, such as Sea Island and Allen Long Staple, which produces fine, soft and silky fibres from one and a third to one and five-eighths inches long.

Porto Rico has a mild, even, almost uniform climate, because there are no abrupt changes in temperature, and the variations noted for a period of several years are from 78° to 82° F. Greater changes are noted in the average monthly temperature, which varies from 82° to 99° F. in August to a minimum range of 75° to 57° F. in January.

The rainfall is far more abundant in the central part of the island, where it reaches a maximum of 100 inches; while the average is about 60 inches. The greatest rainfall occurs during the summer and autumn months, while the spring months are dry especially along the southern coast. The rain begins to increase in April and reaches the maximum in August or September. The relative humidity is considerable, sometimes reaching 80 per cent. For the reasons given, we believe that Porto Rico possesses the ideal conditions of temperature, moisture and light for the culture of Sea Island cotton and similar varieties. Repeated experiments made by the writer, especially in the mountainous region of Utuado, have proved that all localities of Porto Rico are advantageous for cotton culture.

I have planted Sea Island cotton in nearly every month of the year, and have observed

its development and conditions of growth with great care. These tests indicate that the month of March or about the middle of the spring is the best time for planting. I have also observed that at this time of the year, the growth of the plant occurred during a large part of comparatively cool weather, when the sun is not obscured and when the amount of water in the atmosphere and soil is most favorable to plant growth, on account of the moderate amount of rainfall.

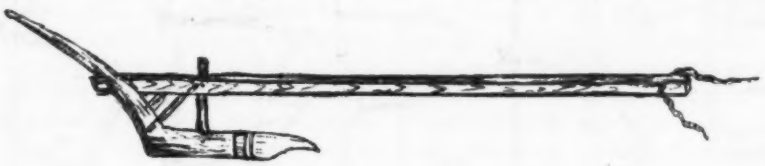
Generally speaking, all the lands of Porto Rico, those near the coast as well as those of the mountainous interior, are well adapted for cotton culture. The slopes of the interior are not as fertile as the river valleys and the coast lands, which are mostly alluvial plains; but, in spite of this fact, the writer has obtained very encouraging results both as to quality and quantity, averaging from six and a half to seven hundred weight per acre. He has obtained the best crops while experimenting on meadow land and upland of Utuado, where an average crop of from eight to nine hundred weight per acre was gathered. These experiments were made on the lands of the Armstrong Agricultural School, of which the writer was director and on a piece of private property which he cultivated. The results correspond with the experience of others.

The practice in vogue in different localities consists of pure routine, instead of being based on scientific agriculture.

All important crops require proper preparation of the soil, and cotton is no exception to the rule. In many places a thing considered indispensable by every good farmer is not properly attended to, either through ignorance or through economy. Proper plowing of the soil is absolutely necessary. Nevertheless, in certain parts of Porto Rico, the sod is first broken by the old-fashioned wooden plow, a primitive implement of agriculture, such as was first used by the Spanish settlers after the conquest of the island about four hundred years ago. This plow is drawn by oxen hitched to its tongue by the horns. The lower part is covered by an iron point, which penetrates the soil for a few inches, but without turning it as is the case with the modern steel plow. Naturally, with this treatment of the soil, it is impossible for the latent elements of the subsoil, to be properly influenced by the action of the atmosphere, nor can the physical and chemical changes necessary for plant nourishment take place.

After the first plowing with the implement described, the land is allowed to lie about fifteen days, which is altogether too short a time to allow the vegetation to decompose and serve as a fertilizer.

A second plowing with the wooden plow above described completes the preparation of the soil; and thus without pulverizing or harrowing the land, with numerous, large hard clots of soil, the writer has seen Sea Island cotton seed planted in holes made about a foot apart and in rows three feet apart. But in spite of this unscientific manner of planting, the seeds germinated well, and at the end of several months we saw a choice field of cotton, which gave indication of an excellent crop.

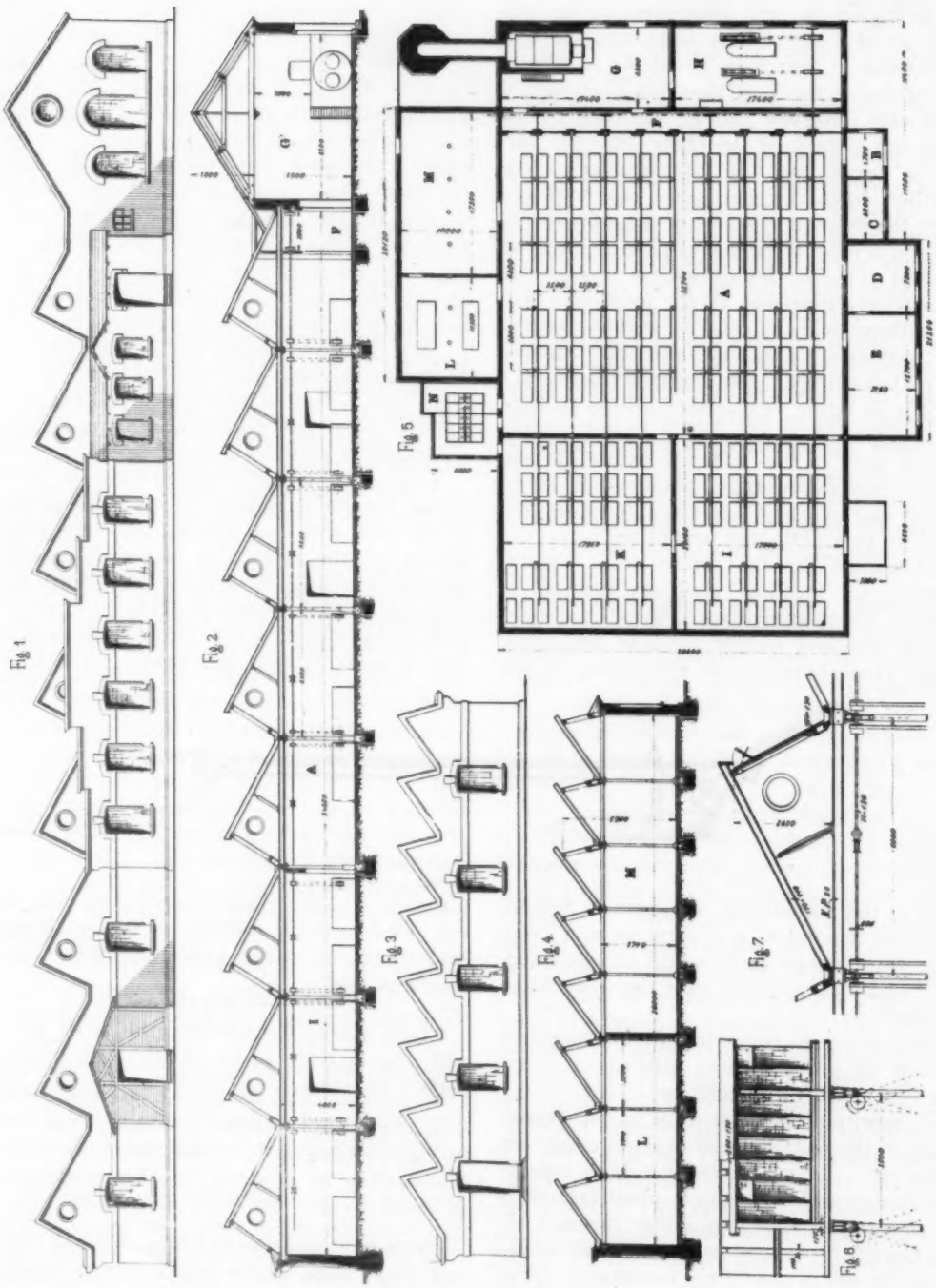


AN OLD PLOW USED IN PORTO RICO.

Under normal conditions the wool fibre will contain from 14 to 18 per cent. of absorbed moisture.

The wool fibre varies in length from one to eight inches and in diameter from four-thousandths to eighteen ten-thousandths of an inch.

There is a tradition in China that silk culture dates back to the origin of agriculture. From ancient times the Son of Heaven directed the plough; the Empress planted the mulberry tree.



A BOHEMIAN WEAVING MILL.

A BOHEMIAN WEAVING MILL.

The weaving mill shown in the accompanying illustrations was built according to English plans for H. Guertler's Sons in Gabel, Austria. The spooling, twisting, winding and shipping departments are conveniently arranged in one building with the weave room to which the power house is attached. The dyeing, warping and similar processes are carried on in separate buildings.

Fig. 5 shows the arrangement of the different rooms. The weave room is nearly square being 104 feet by 115 feet, equal to 11,960 square feet. It contains 119 power looms, 68 of which are double and 15 single. Access to the open air is obtained through the double doors in the hall, B, which is lighted by a large window. In this room a small office has been built. The watchman's room is at C, 21 feet by 12 1/2 feet and which is divided from the hall by a 12-inch wall. Next to the watchman's room is the store room, D, 24 ft square, from which supplies are delivered. Adjacent to this is the shipping room, E, 41 feet by 24 feet. Both rooms, D and E, are connected by doors and delivery windows with the main weave room. The windows are for the purpose of delivering and receiving yarn and cloth. All the rooms mentioned are well lighted by windows of suitable size. The height of the weave room in the clear is 13 feet and is lighted from above by skylights in the saw tooth roof. These windows, 18 feet by 7 feet, are built with iron frames. Swinging windows are placed at intervals to allow ventilation. In this way the room is well lighted in every part.

All the rooms including the weave room, spooling, twisting and sizing departments and power house are ventilated by blowers. The walls of the building are 12 inches thick and well screwed with iron rods. The roof is built partly of wood and partly of iron and is supported by heavy iron beams which in turn rest upon cast iron columns. There are six rows of these columns in the weave room, 22 feet apart and so arranged that four looms can be placed between them. These pillars rest on granite blocks, 18 by 18 by 14 inches, placed on hard brick piers, as shown at Fig. 4. The looms are so arranged that there are two 9-foot alleys, one in the center and one at the left. At the right next the belt room is a narrow alley. The floor is made of cement. On the floor between the looms are placed wooden racks on which the weavers stand, and which protect them from direct contact with the cold floor.

The looms are driven by counter shafts which are connected with the power house by belts running in the belt room, F. The counter shafting is 2 inches in diameter and has a speed of 120 revolutions per minute. The belt room, F, is 6 1/2 feet wide, and separated from the weave room by a 6-inch wall which is strengthened by iron supports 2 by 5 inches. The belt room is accessible from both the weave room and the power house through doors at the rear of the weave room. There are two doors from the belt room to the power house, G. In the latter is a horizontal boiler built for 105 pounds pressure and having a heating surface of 550 square feet and a water capacity of 230 cubic feet. A chimney 150 feet high is 24 feet from the power house.

The power house is separated from the engine room, H, by a 24-inch wall. The engine room is 26 feet by 27 feet and contains two non-condensing steam engines, with 12-inch cylinders and 24-inch stroke. The speed of the engine is 100 turns per minute. One of the engines is used for driving the mules and the other is kept as a reserve and for driving the dynamo by which the mill is lighted.

At the left of the weave room is a cloth winding room, I, accessible from the weave room by two doors. Access to the open air is obtained through the door which opens into the hall way as shown in Fig. 5. This room, I, is 56 feet by 57 feet. It accommodates 24 winding and 16 twisting machines. A 12-inch wall separates it from the spooling room, K, 58 feet by 65 feet and which contains 42 spools. The sizing room is 33 feet by 32 feet and in the rear of the main building. Adjacent to it is the room, M, 56 feet by 32 feet, used for beaming and drawing-in. Both rooms are connected with the weave room by doors. Closets are located at the end and accessible from both the weave room and the spooling room. The slanting

roof is covered with well burned red brick and lined on the inside with planed ceiling. The outside of the building is coated with cement.

Figs. 1, 2, 3, and 4 show elevations of the building. Fig. 5 is a ground plan. Figs. 6 and 7 the plan and elevation of a section of the roof.—(Translated by the Textile World Record from Uhland's Technische Rundschau.)

The Cotton Growing Associations of Europe.

As was predicted by many including the shrewd cotton dealers of Liverpool, the enthusiasm for growing cotton in the British colonies is unable to survive a bumper crop in America. When cotton was selling for 15 cents a pound and cotton mills in every part of the world were shut down for lack of raw material it was easy to alarm the spinners and weavers of Europe and induce them to join cotton growing associations; to dream of immense crops from distant and practically unknown colonies; even to contribute to the support of the cotton growing associations. All this is changed when American cotton can be bought in unlimited quantity for 8 cents per pound. As a result the recent appeal for funds by the British Cotton Growing Association is meeting with a weak response. Of $2,500,000 asked for, it is said that only $825,000 was subscribed, and while the managers may keep up the organization for a time, whose duration will depend on the price of cotton, sooner or later they will have to bow to the inevitable. The various European cotton growing companies, British, French and German, are all based on a radically unsound principle of doing business, that of seeking the line of greatest resistance. The natural course is by the line of least resistance and leads directly to the cotton fields of our Southern States. It will be time enough to stimulate production under unfavorable conditions when the possibilities of the South are exhausted. The vast crop of 1904-5 that responded to a little extra exertion on the part of our planters indicates how great a distance we are from such exhaustion. What sense is there in subsidizing steamship companies, building railroads and wagon roads in Togo and teaching a lot of savages to raise a little dab of low grade cotton costing four times what it is worth in the mill, while the best cotton in the world can be raised under the most favorable conditions in our Southern States? Europe can get all the cotton required and without the possibility of loss by investing in our cotton fields.

TEXTILE ADVERTISING THAT HAS SUCCEEDED.

[This is the second of a series of twelve articles, which will recount certain tangible success in the advertising of textiles along the lines advocated by the series of articles published last year. Last year Mr. Balmer discussed in a series of six articles, treating the necessity and possibilities of textile advertising, the planning of the advertising campaign, and general publicity and work upon dealers, and followed these with a series of six other articles, each article being an investigation into the present state of the sales of six leading textile lines. This was theory, even though it was theory born of experience. The new series will treat of actual successes—no theory at all, but fact—something that has happened. They are living instances taken from every-day advertising life, and examples of the application of the theories that have formed the subject matter to the preceding articles.]

Before I describe any more specific successes of the textile advertisers, I realize that it would be best to present the results in general. I am aware that many manufacturers are interested in this advertising campaign that has been in progress since September, 1903, and that they would like to know just what has been the fruit of this eighteen months. In this article I intend to answer these in as accurate and concise a form as possible.

In describing the success of a few firms in particular some readers may have reason to claim that such methods that were good for a few men might not do at all, while an account of an individual manufacturer's progress may be an instructive example, some manufacturer may want more general proof of the laws which are known to be necessary to growth. Lest they should regard these few successes as exceptions to the rule, I desire to prove the rule first.

If you will look through the magazines of two years ago, you will see very few advertisements of textiles. Scarcely any fabrics, silks, or any kind of dress goods were given

publicity. Trade-marked fabric was not considered. To have a customer call for goods marked with a particular sign on the selvage was almost unknown. In my own magazine, The Butterick Trio, where one would expect to find such advertisements that would appeal to women, if any place, there were less than 4500 lines in 1903. It was in the fall of this latter year that I began to interest textile advertisers in the opportunities there were for them in advertising. Since September, 1903, sixty-two manufacturers of textiles, representing all kinds of goods, have become interested to take space in The Butterick Trio. This last year, (1904), 36,258 lines of space was bought by these advertisers in the Trio, while in the April issue, this spring, $23,985 was spent to advertise dress goods, hosiery, underwear and other textiles, which does not include the $18,000 worth of space bought by manufacturers of corsets, ready made garments and general dry goods.

Perhaps it would be interesting to know in just what lines the most of these new advertisers come. Blankets 2, Cravenettes 2, Dress Goods 17, Handkerchiefs 2, Satins 2, Silks 3, Skirts 2, Stockings 8, Tapestries 2, Thread 2, Towels 1, Underwear 12, Yarn 4, Miscellaneous 3.

Now as to the methods which these advertisers have used and the varying results which they have met, I offer the following summary. Of course, it is very difficult indeed to get a man to tell you the inside facts of his business, just how much certain advertisements have brought him. Again, I must not be misunderstood that I believe success will come to all textile manufacturers who advertise, or even every one of those who have followed methods that are known to be the best. Of course, there are failures in any line, especially in any new undertaking, but what I have found to be true in this textile campaign is that the percentage of failure among those who have used large space and concentrated their efforts in mediums of great circulation, among those who have trade-marked their goods and advertised their brands to the consumer, the percentage, I say of failures among these, has been small.

I cannot report upon all those who have taken space in The Butterick Trio, for reasons that I have just mentioned. The manufacturer is, of course, chary of giving information regarding his business to his competitors, but I have heard definitely from seventeen of these firms and the results which they have obtained from their advertising have been satisfactory. Indeed in many of these seventeen cases the number of replies and the accounts they have opened with dealers have surprised even the advertisers themselves.

Of these signal successes, one is a manufacturer of cravenettes, five make various kinds of fabrics and dress goods, two are manufacturers of satin, one of silk, two are hosiery concerns, one makes tapestries, two underwear and three are manufacturers of yarn. As an example of these results, I repeat what one manufacturer told me, that 25,000 inquiries have come into his office in answer to his advertising in women's publications, and he just began advertising the first of the year. A certain knitting company told me that their increase in business this spring was 25 per cent. above that of last year, and they only began advertising in the October number. They took space in The Butterick Trio, Ladies' Home Journal and Good Housekeeping and in a few weeks had received about 5000 requests from women and had added 44 new dealers to their list. Among them were such houses as R. H. White & Company, Abram Strauss and John Wanamaker.

Now the first thing I impressed upon the advertisers who took space in The Butterick Trio was, as I have said before, that they must have some mark which would identify these goods, so that the customer may know what name to insist upon. The advertisers have presented with good forceful copy, illustrations of their goods, with a reproduction of the trade-mark in plain sight upon them. This gives the woman who reads advertisements, a better idea of what to look for when she goes to her dealer, especially is this true if the goods are unknown to her before she sees the advertisement. In fact, goods without trade-marks were advised not to be advertised in any publication. This insisting on the necessity of a trade-mark has been appreciated among the textile manufac-

turers. As direct proof of this I have referred to the patent records of the government. The number of trade-marks granted during twelve weeks of the fall of 1901 was 364; for the same number of weeks in 1902, the number was 559; for 1903, 514; for 1904, 459, but the textiles trade-marked during these weeks were in 1901, 34; 1902, 41; 1903, 39; 1904, 62. Although there were not as many trade-marks granted during these weeks for 1904 as there were in 1902 and 1903, there were more trade-marks taken out by textile manufacturers during this time. In fact, the number of textile trade-marks has increased from 50 per cent. to 60 per cent. during the last year, (the exact increase for these weeks mentioned was 63 per cent.).

As to the methods which these textile manufacturers are using in their advertising. I might put down the first as large space. A firm who received 15,000 replies from The Butterick Trio ad, used only pages and double columns for their advertisements. The fabric mill that has received the most satisfactory returns, has used nothing less than 268 lines so far this year. A satin manufacturer, who used nothing larger than 56 lines last year, has given decidedly better results on enlarging to 200 lines. The general tendency has been toward "must-be-seen-advertising," the kind that is large enough to demand the attention.

I glanced over the records to see just what increase of space these advertisers had taken. I figured up three manufacturers of dress goods, one of cravenette, one of hosiery and one of tapestry, who had taken space last year in this and compared them with the amount taken this year. Four of the six had already bought more space during the first four issues of this year than they had for the entire twelve months of 1904. Their total number of lines was 5172 in The Butterick Trio for 1904, while in the issues from January to April of this year, they had thus far used 7286 lines. These advertisers have not increased their space just to test my policy, but they have done so, because they have found that the increase was profitable.

Other general characteristics which should be noted in the campaign of these successful advertisers are the use of illustrations, the copy which gave definite reasons for buying this brand, and the use of the follow-up system, which were directed to influence the dealers as well as the consumers. The readers were asked to send in the names of their local dealers, some small offer being given for the securing of these names. In this way the advertising, though in women's publications, not only appealed to the consumer, but was a definite step in gaining the trade of the merchants.

But this mention of the increase in textile advertising should not be taken as a summing-up at the end of a campaign. The work has only just begun. There are still many manufacturers who are "doubting Thomases" of the opportunities they have in the publicity of their goods. Although over $75,000 worth of space has been bought in the first four issues of The Butterick Trio this year, I realize that this is still a small percentage of the great amount which should be spent today by all manufacturers. The amount of capital invested in textiles, according to the last census, (1900), was $1,366,604,058, while the value of the products was $1,637,484,484. These figures, of course, are greatly increased today and the total value is close on to two billions. If but 5 per cent. of the capital invested (and this is a small amount for pushing a new line) was spent for publicity, it would amount to nearly $150,000,000.

The work is, as I say, just begun, but the results of the opening methods have been most encouraging and many who doubted whether advertising could do anything for their brands are now among the most enthusiastic over their results. As I claimed in my opening article, trade-marked textiles can be and must be advertised, if the manufacturer wishes to protect himself and build up his brand, and these results bear me out in my statement.

THOMAS BALMER.

Early in the reign of Tiberius the Roman Senate passed a law that silk should be worn by women only. The next emperor, Caligula, had silk curtains to his throne and wore silk as part of his dress when he appeared in public.

TEXTILE PROCESSES.

EDITED BY E. A. POSSELT.

THE MANUFACTURE OF SILK FROM FIBRE TO FABRIC.

VII.

Carded or spun silk yarns, as will be readily understood, are greatly inferior as compared to the reel silk yarns, the same being:

1st. The waste product obtained during reeling the silk.

2d. Soiled and pierced cocoons, as well as inferior cocoons it would not pay to reel, or such as will not reel.

3d. Waste made during cleaning and throwing the silk, in the mill, as well as such coming from the weave room, etc.

Such silk waste product is then carded, or carded and combed, and in turn spun somewhat similar to either the woolen or the cotton or worsted yarn.

Before buying this raw product the manufacturer should carefully test samples of it, and thus ascertain the actual amount of silk fibre in the lot, for the fact that these silk wastes vary considerable in quality, being frequently subjected to adulteration with lime, etc.

Another point the manufacturer must not lose sight of when buying such silk waste is the purpose of the yarn he has to produce from said article. For example, if the final yarn to be produced has to be used in the manufacture of plushes, then we must carefully examine said waste product submitted with reference of containing any hard ends technically known as "shiners" and which are a frequent occurrence in waste product at the reeling, or the silk mill during cleaning and throwing the silk, also such waste as coming from the weave room, and which is not suitable for such plush yarns, the best raw material for such plush yarns being cocoon waste.

In connection with some kinds of spun silk yarns the first operation the raw material is subjected to is boiling off or scouring, and which consists in removing lime, dirt, gum, etc., from the fibres. It is done in large tanks in which the silk waste is steeped for from one to two days with a solution of soap and in turn boiled in this solution for about five hours, after which the material thus treated is removed, washed, hydro-extracted and dried, and when in turn it then is ready for the carding process.

But in connection with shappe—or floss—spun silk, the gum is retained right up to the spun yarn, for which reason such yarns are of a much darker color and unsuitable for light shades. It also loses some of the gum in dyeing and consequently shrinks in weight, shrinking considerable more than ordinary spun silk, for which reason it is impossible to combine these two classes of yarns in piece dyes.

In carding silk waste direct, one great trouble is that the silk wraps more or less around the rolls on account of its great length and cannot be removed without trouble and loss of time. The same trouble is found in combing it after the carding process has taken place. This principle of the material, winding itself around the rolls, is made use of in a most ingenious method of preparing silk waste threads for re-manufacture in silk yarns, in turn changing a former disadvantage into an advantage, by cutting the fibres into nearly equal lengths after they have been wrapped around a cylinder, the fibres then not being long enough to cause trouble by wrapping around the rolls in the carding engine. After subjecting waste silk threads to this process, they can be most readily spun on what is termed either the cotton or woolen plan.

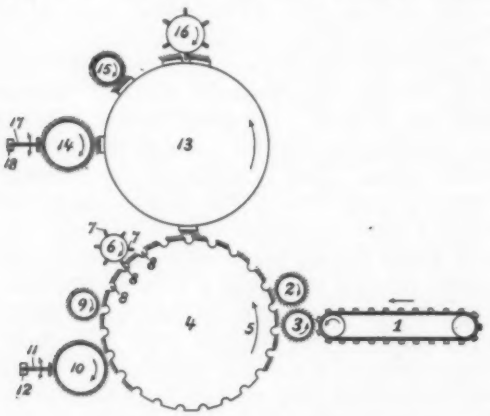
The accompanying illustration is a vertical section, partly in side elevation, of the system of cylinders, rolls, and cutters as used in the machine for thus preparing silk waste.

In the same, 1 indicates an endless apron which feeds the silk waste into the feed rolls 2 and 3, provided with teeth, and which in

turn feed the waste gradually into the teeth of the large cylinder 4, which revolves as indicated by the arrow 5, and has sections of card clothing and cutter knives arranged over its circumference at distances equal to length desired to have the waste silk cut. 6 is the rotary cutting wheel, which carries knives 7 on its circumference, the cutting edges of which mesh with knives 8 of cylinder 4.

Nine is a "fancy" placed there for the purpose of bringing the silk onto the surface of the teeth of cylinder 4, so that the same, in turn, can be readily taken off by the doffer cylinder 10, which pulls the silk waste from off the large cylinder 4, due to the fact that the latter has a greater surface velocity than the doffer, and carries it around to the doffing comb 11 which oscillates on pivot 12 and scrapes off the silk waste which now has been straightened out.

Thirteen is another large cylinder, like and for the same purpose as 4, whose surface is very close to cylinder 4. 14, 15 and 16, respectively, are rollers corresponding in con-



struction and operation to rollers 10, 9 and 6 previously referred to in connection with the large cylinder 4. 17 is a doffing comb which oscillates on pivot 18 and is placed there for the same purpose as comb 11 in connection with doffer cylinder 10.

The same process takes place in this upper set of rollers as in the lower set of rollers, previously explained, and the purpose is to remove the surplus waste and straighten out all knots and kinks from same, a feature done by the action of the teeth of cylinder 13 upon the teeth of cylinder 4, since their teeth point in opposite directions at point of contact.

The silk as thus combed off doffer cylinders 10 and 14, is now straightened out, cut in proper lengths, and ready for remanufacture of yarn, either by the regular cotton or woolen yarn process.

After carding such spun silk as destined for spinning after the woolen system—the coarser, cheaper, lower counts of spun silk yarn—are treated correspondingly; where as such as manufactured after the cotton or worsted spinning principles are in turn subjected to drawing, roving and such again reduced in size and made stronger by the addition of twist in the spinning operation. The spun yarn is twisted with another, or with two others, to form twofold or threefold yarn, and is then singed, in order to remove nibs and lumps which are on the surface of the twisted threads. Singeing consists in passing the threads through a blue gas flame, and when the lumps are thus burned off and fall from the yarn in the form of a brownish ash. Spun silk yarns differ considerably from reeled yarns by being fuller, bulkier, and softer; but have less lustre than reeled yarns, are not so level, and cannot be spun to such fine counts as reeled yarns. Nearly all single-carded yarns are very lumpy, and covered with nibs of silky material, and unless they are very heavy counts they are not sufficiently strong to withstand the tension in the singeing operation.

For the production of velvets and plushes these spun silk yarns are extensively used, also for many other purposes where formerly reeled yarns were used, for example for striping and checking in woolen and worsted fabrics, for silk handkerchiefs, hosiery, laces, etc. Combination yarns from them are also largely made by twisting a silk thread around a woolen, worsted, or cotton threads. They are also used extensively in the warp with a woolen, cotton, or worsted filling for the production of umbrella cloths, scarfs, etc.

Spun silks are calculated as to the size of the thread, on the same basis as cotton (840 yards to 1 hank), the number of hanks one pound requires indicating the counts. In the calculation of cotton, woolen or worsted,

double and twist yarn, the custom is to consider it as twice as heavy as single; thus double and twisted 40's (technically 2/40's) cotton, equals single 20's cotton for calculations. In the calculation of spun silk the single yarn equals the two-fold; thus single 40's and two-fold 40's require the same number of hanks (40 hanks equal 33,600 yards). The technical indication of two-fold in spun silk is also correspondingly reversed if compared to cotton, wool and worsted yarn. In cotton, wool and worsted yarn the 2 indicating the two-fold is put in front of the counts indicating the size of the thread (2/40's), while in indicating spun silk this point is reversed (40/2's), or in present example single 80's doubled to 40's.

(To be continued.)

A SCOTCH NOVELTY IN THE CONSTRUCTION OF JACQUARDS.

By means of this jacquard the pile warp threads in double pile carpets, woven face to face, pass from the upper cloth to the lower cloth, as required by the design, and when not needed, float between the fabrics. Such a fabric figured on both sides is of quality resembling that of the usual hand tufted carpet, while in the manufacture, on account of the figure showing on the upper face of the top cloth, the weaver can readily discern whether any of the warp threads have become accidentally broken.

In the new jacquard we find provided

A STATIONARY BOARD

to hold up the lower series of knots, so that the warps connected to the cords are in a floating position,

AN INTERMEDIATE LIFT BOARD

which lifts the upper knots on the selected cords and retains them momentarily in raised position, so as to raise the corresponding warp threads to the top cloth, to be there woven, and

A TOP LIFT BOARD

which is lowered to allow the lower knots of the cords not selected to rest on the bottom board, while on the intermediate board descending the selected cords are lowered to lower the warps connected thereto to the bottom cloth and are again lifted to the floating position when the top board is raised.

With reference to the accompanying illustration, Fig. 1, which shows the new jacquard machine in its section, h indicates the top lift board, to which all the knotted cords i of the jacquard machine are attached, and which board is suspended from and operated by a

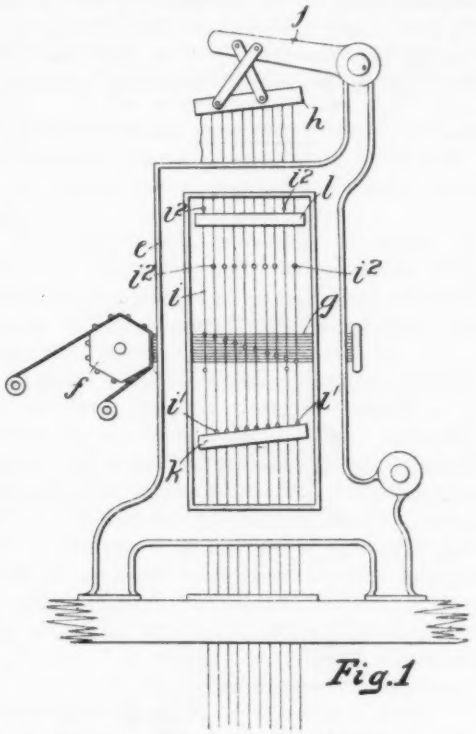


Fig. 1

swinging lever arm, j. K indicates the stationary jacquard retaining board, and l the intermediate jacquard lift board operated in the usual manner. The top lift board h is shown raised high enough to raise the cords, i, so that the bottom knots, i^1, are all above the stationary board, k, and through which the cords pass to the usual mails in the jacquard harness as situated below the jacquard machine.

In this position the jacquard card on the cylinder, f, is pressed into contact with the ends of the needles, g, so as to act on certain of such needles as selected according to the pattern and to deflect the corresponding cords. The jacquard lift board, l, is then raised to the position shown in the illustra-

tion, lifting with it, by the knots, i^2, the cords, i, that have been selected by the card on the card cylinder, f, up to the full lift, so that the pile warps attached to said cords are raised to the back of the top cloth in the loom. While the lift board, l, so retains these warps, the top lift board, h, is lowered, leaving the cords, i, and knots, i^1, not selected by the jacquard card, on the stationary board, k, the pile warps attached to these cords being held floating between the top cloth and the bottom cloth, as previously mentioned when referring to the construction of the fabric. This completes the first cycle of operations.

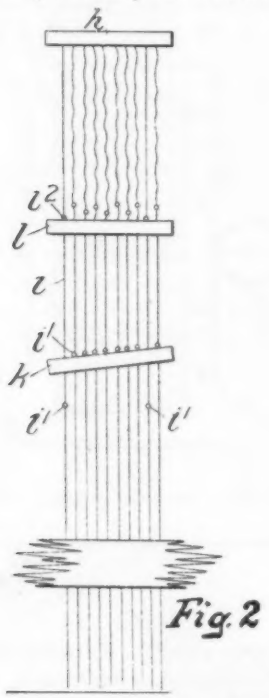


Fig. 2

In the second cycle the jacquard lift board, l, is lowered so that the selected cords, with the knots, i^2, which had raised the selected pile warps to the top cloth, are lowered, together with the corresponding knots, i^2, as indicated in diagram, Fig. 2, to lower these warps down to the bottom cloth, in which they are woven. For this purpose the tails in the boards, l and k respectively, run in opposite directions. When this has taken place, the top lift board, h, is raised, so as to bring all the pile warps to float midway between the two cloth structures, and all the knots, i^1, are raised above the stationary board, k, while the knots, i^2, are all hanging in position ready for a repeating the first cycle of operations, when a fresh jacquard card on the cylinder, f, is brought to act on the needles and the lift board, l, is raised.

PRACTICAL POINTS ON SPECK OR BURR DYEING.

There is no other process in the finishing room as tedious as that of removing specks in the cloth by hand, either by means of the specking irons or by covering the specks by means of a pen with ink. Certainly if the fabric contains only few specks, and when the construction of the cloth is such that it would be injured by the process known as speck or burr dyeing, then one or both of these hand processes certainly must be made use of. However, in ordinary cases it is more advisable to use the burr dye process, since in this instance the face of the fabric is not disturbed as is the case when using specking irons, and when goods after this procedure, now and then, have to be sent back to the shear for smoothing the nap, before they are in a fit condition for being sent to the market. This, in some instances, may be due to the amount of specks to be taken out, or in other cases due to the dullness of the specking irons used, again it may be the fault of the girl who did the work. Since the process of burr dyeing is more or less a necessity in connection with a great many woolen as well as union fabrics, it next remains to explain how the process should be conducted, so as to give satisfactory results.

Burr dyeing has for its object to cover, i. e., color dark, only the vegetable specks or impurities in the cloth; it will not affect a wool speck, which the same as if not burr dye had been used will have to be removed by hand finally. Burr dye is made of logwood, blue vitriol and soda ash, a good recipe for it being:

Extract of Logwood	48 lbs.
Soda Ash	30 lbs.
Blue Vitriol	12 lbs.

This should make about 100 gallons of a burr dye that can (properly diluted) be used

with safety upon almost any kind of woolen or worsted, excepting cotton mixtures. The dye will stand at about 10°, and has to be diluted with cold water to suit the fabric under operation. This burr dye, as in fact all others, must be used only when perfectly cold; again it will not do to allow the goods to stand still in the liquor any length of time.

Another recipe for a burr dye is given thus:

Extract of Logwood .....200 lbs.
Soda Ash .....110 lbs.
Blue Vitriol ..... 50 lbs.

This should make about 200 gallons of a burr dye, and which also has to be reduced with cold water previous to using it. The extract of logwood as used for burr dye can without disadvantage be of an inferior grade, or hematine will do just as well. This logwood or hematine is put into a tank with sufficient water to fill said tank about 1/8 full. Then add the blue vitriol, turn on steam, and bring the mixture to a boil, after which turn off some of the steam and boil moderately, until all the vitriol has been dissolved; then turn off the steam and let the liquor stand for a few hours to cool, adding at the same time a pail or two of cold water. Then add the soda ash, but remember, very slowly and carefully, since as soon as the soda ash and the vitriol come in contact, fermentation sets in, and the liquor will begin to boil and rise, and possibly run over in the tank, and thus the best part of the coloring matter be lost.

When all the soda ash has been added, let the liquor stand for some time, in order to give it a chance to slowly work, and at the same time, if at any time there are signs of it rising, add a little cold water. Agitate the ash gently until you can stir the liquor without it showing signs of much rising, then turn on steam and bring it slowly to boil, and in turn keep this up for about four hours. Next turn off the steam and fill tank with cold water, keeping the liquor well stirred while the tank is filling.

When the process is finished, the liquor should possess clearness and richness (a clear plum or claret) of color, when, however, if the color is muddy and of a dirty blue, gray or black shade, it is a sign that an error in preparing it has been made, and that the dye will give poor results when used. Never combine the coloring matter with the ash first and then add the vitriol, for in this manner the best strength of the extract of logwood is wasted, while if it is combined with the vitriol first and the ash added last, all of its power is retained. Combining the vitriol and ash with water, and then adding extract of logwood, will also give poor results, there being something in the extract of logwood which needs fermentation, and which is omitted by this combination of the ingredients. In the same manner adding all three ingredients at one time into a barrel or tank, and this to boil with a small amount of water, will also give a poor, if not valueless burr dye.

The more soda ash there is used, the deeper a claret the shade will be, while, if the amount of vitriol used is increased, then the shade will lean more towards the blue cast than the claret.

A point which sometimes puzzles a finisher is just how strong a burr dye should be in order to produce results. This, naturally, varies more or less with the kinds of goods treated, that is, the character and abundance of specks and burrs which it has to conceal; also upon the method adopted in applying, as well as upon the time when the dye is used. Under ordinary circumstances, and upon a fair grade of stock, the dye will be found to work well at 1 1/2° to 3°. The quantity of dye to be applied to the goods also varies with the amount of work which it has to do, and with the method of its application.

Some finishers use the dye in the washers before gigging the cloth, and when about three pails of the 3° dye to the piece will do the work. The operation in this case is thus: Run the fabrics in the washer sufficiently long to thoroughly start the soap and dirt; and do not add the dye until a good, clean lather has begun to show. Each piece should run in its three pails of dye for at least twenty minutes before the rinsing in cold water has begun.

However, the best plan is to defer the burr dyeing until after the goods are gigged. In this instance, although we may use the same amount of dye,—about the same, viz., three pails to the piece,—yet it is only necessary to have it about half as strong than if burr dye-

ing in the washer, in order to accomplish the same results, 1 1/2° in most cases being quite strong enough for all practical purposes.

A good method of applying the burr dye to the goods is thus: The dye is contained in a large square tank, a roller frame being adjusted in the tank and on which the cloth is run from a pile outside on the floor. The cloth is thus run up from the floor and down into the liquor, being passed over the top row of rollers and under the lower row alternately. Then just before it passes out of the tank, it is run between two large squeeze rollers, in order to save the surplus dye liquor, which thus runs back into the tank and is re-used. From these squeeze rollers, the fabric is run on a roller or directly into the washers for the removal of the loose dye and the final cleansing. In its passage between the large pressure rollers the cloth must be carefully smoothed, and not allowed to curl or wrinkle under at the selvages. By this method of burr dyeing, the cloth is not allowed to remain in the dye too long at a time, and the liquor is evenly and uniformly distributed over the whole piece, so that no part of the goods receives more than the other. Cloudy and shady goods will not be liable to form if care is taken.

In most cases, however, the burr dyeing is done in the washer, in which case let the goods run 20 minutes in the dye, and then rinse well and give a bath of fuller's earth after that, which will prevent all danger of the goods crocking.

When dealing with union cassimeres, and all goods which have cotton warp and wool filling, we must resort to different plans for burr dyeing, or else a different effect will be produced upon the cotton from that produced upon the wool portion of the fabric, for the fact that if the dye were so made that it would produce exactly the desired effect upon the wool and cover nicely all the specks and dyes contained therein, it would be most likely to tinge the cotton in the fabric to such a marked extent as to materially affect the whole appearance of the piece. For such goods a good recipe for preparing the burr dye is thus:

Extract of Logwood .....175 lbs.
Soda Ash .....140 lbs.
Blue Vitriol ..... 90 lbs.

This produces 200 gallons of a dye which stands about at 15°, and which for dark shades should be reduced to 2°, and for light to 1°, while 2 1/2 pails to a 6 x 4 piece, and from 10 to 15 minutes' application in the washer (considering a fabric previously gigged), will give proper results. The rinsing after this is a very important step, and must be carefully and thoroughly done, with a good rich flow of pure water, otherwise goods may crack. Plenty of time must always be given for this scouring or rinsing after burr dyeing, since, unless it is well done, this result is inevitable. If it is desired to produce a sort of blue cast on these fabrics, a case often called for, it will be necessary to employ about twice as much blue vitriol and half as much soda ash. But here there will be trouble unless the greatest care is taken not to use too much of the vitriol for the good of the cloth. The amount which can be safely used will depend largely upon the condition of the goods, but under any circumstances enough should be used to cover all the burrs and specks, or else its purpose will have been in vain.

Any batch of burr dye should be always tested before it is used, and, if possible, kept exactly uniform for all similar styles of goods. Again it must be applied in even and regular quantities, and the goods must always be allowed to remain in the dye for the same length of time. The dye is always best in its action when perfectly cold. However, not only must we use a perfectly cold burr dye, but at the same time the goods must be also in a cold state, and to make sure of this, give them about five minutes' run in cold water after putting them in the washer, but be sure and have them well drained before running them through the burr dye tank, or adding the dye in the washer, provided no special burr dye tank is used. In the latter case never leave water in the washer to thus reduce the dye, for such a procedure will result in uneven work. Always reduce your dye to the exact strength wanted before giving it to the goods.

HUMIDITY.

There is no doubt but that a warm and at the same time humid (moist) atmosphere is the one best adapted for the purposes of spinning cotton yarn, both conditions, heat and moisture, going hand in hand, and play a most important part in the production of smooth and strong yarn for the fact that the cotton fibres are of a hygroscopic character, i. e., have the property of absorbing moisture, and in this way become, for the time being, less brittle, more pliable, and capable of being more thoroughly incorporated among themselves in the formation of a perfect thread. Electricity in the mill as produced by the friction of belts and other moving parts of machinery is a disturbing agency among loose fibres and causes fuzziness in yarn, especially in dry weather, but when the presence of moisture in the air neutralizes this effect considerably. It is also for this purpose that a reasonable degree of humidity is desirable.

With reference to proper heat, this has long been easily enough attained by arrangements of steam pipes, made of wrought iron, through which high pressure steam is forced. The higher temperature of the steam enables a much larger radiation to take place than is possible with low pressure, and the pipes used are correspondingly smaller.

Although there are differences of opinion as to the proper temperature for cotton spinning, from 70° to 90° F. is the usual temperature and while some spinners on coarse yarns are satisfied with 70° to 75° F., some spinners of fine counts may stop at nothing short of 95° to 100° F., but which may be considered quite unnecessary if proper attention is paid to humidification.

The chief advantages of humidity and proper warmth in a spinning room are, that the cotton will work better and having more elasticity will spin better and in turn give better yarn especially so on dry, hot days. In the card room, however, there is less need of humid atmosphere, besides there is danger of rusting the teeth of the card clothing or the needle of the comber, if such are used.

Regarding the proper amount of humidity to have present in a cotton spinning mill, about sixty per cent. of relative humidity is generally considered to be the most advantageous conditions, that is considering fibre, machinery as well as the help.

However, as already previously referred to, humidity in a spinning room is not the only factor to be taken into consideration. For example, yarn may spin well say at 75° F., but if now the temperature should be raised, say 20° F., everything else remaining the same, there will at once occur a vast difference in the humidity of the room, although the actual amount of moisture in the room remains, showing that the relative humidity in the room changes with the increase in temperature.

The term, relative humidity, means the relation in percentage of the amount of moisture in the air at that time weighed in grains per cubic foot as compared with the amount of moisture that the air would contain if it were perfectly saturated, and when any more moisture would be put in that space, it would be condensed or precipitated.

When entering any well heated room, you may notice that the air is very dry, having a parching effect, although as a matter of fact, a cubic foot of air in such a room may contain just as much humidity as in a cubic foot of air outside, and yet we feel different, clearly showing that the actual amount of humidity in the air it not a deciding factor in our estimate of relative humidity. If a shallow dish containing water be placed in a warm room, said water will, by the natural process of evaporation, change the vapor, i. e., evaporate, the capacity of the atmosphere to absorb this water, or really hold it up in this invisible condition, varying according to the temperature in the room. The fundamental law for this evaporating of water is that at 32° F. a cubic foot of air will retain 2.13 grains of aqueous vapor, while at 100° F. it will retain 19.84 grains of aqueous vapor, i. e., about ten times as much. It will hold no more than the amount stated, the air being then saturated, i. e., has its maximum vapor tension or pressure. If the temperature of this saturated air is in turn lowered, if it is compressed into a smaller volume, or if an attempt should be made to add more moisture to this fully saturated air, then the

moisture already in it will begin to be deposited in the form of dew, the temperature at which it does this being called the "dew point," which in turn varies according to the temperature of the moisture, i. e., the elastic pressure of the particles of vapor increases as their temperature increases, the air itself having nothing whatever to do with the humidity, it simply being a convenient vehicle for heating the vapor as rising from the surface of the water and in so doing increasing its elastic force and enabling still further evaporation to take place; the application of heat to the water itself causing vapor to be given off, and this rising in the atmosphere, will heat the air and so the same result naturally follows.

From the foregoing, it will be readily understood that the greater the heat of a room, the greater the amount of absolute humidity required in order to reach the same amount of relative humidity.

We now will consider the relative humidity. If air contains a certain amount of moisture, say about one-half of what would cause complete saturation, then the amount of humidity of the air is said to be fifty per cent.; so that when we say that air is "dry" we simply mean that the proportion of moisture in the air is little compared with if fully saturated, and for which reason cold air with little moisture in it may be very moist, while warm air with much moisture in it may be very dry; for which reason it will be seen that the expressions "dry air" and "moist air" are only relative terms and simply express the proportion of aqueous vapor present at the given temperature compared with that which the same volume of air could hold.

It will thus be seen that the point of saturation, i. e., the "dew point" is the foundation of our estimate of 'Humidity" or moisture in the air, and for which reason we must know this before the percentage of humidity in a room can be ascertained.

ABSOLUTE MAXIMUM AND RELATIVE HUMIDITY.

Absolute humidity means the actual amount of vapor present in a given volume of air.

Maximum humidity means the amount of vapor that could be present in the same volume of air under precisely the same conditions of pressure and temperature.

Relative humidity means the ratio of the absolute humidity to the maximum humidity, and this is the humidity we are mostly concerned about with reference to cotton spinning.

The instrument for measuring the degree of relative humidity, i. e., drying power of the atmosphere, as we may say, is called the psychrometer or wet bulb hygrometer, or hygrometer for short, and consists of two delicate thermometers placed near each other, the bulb of one of which is kept wet, by being covered with a piece of muslin, the end of which (a kind of wick) dips into a small vessel filled with water.

It is one of nature's laws that when anything evaporates, it absorbs heat, therefore, the water evaporating from the wick which surrounds one of the bulbs of the hygrometer, absorbs or draws out the heat from the thermometer, thus lowering the temperature. The drier the air, the faster the water evaporates from the bulb and the greater the difference would be between the two thermometers. If the air should be perfectly saturated with moisture, there would be no evaporation taking place from the wick, and consequently the two thermometers would read exactly alike.

After ascertaining the difference between the two thermometers, by consulting table

RELATIVE HUMIDITY TABLE.

Difference Between the Dry and Wet Thermometers.

Air temperatures.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
60	100	94	89	84	78	73	68	63	58	53	48	44	39	34	30	26	22	18	14	10	6	2									
65	100	95	90	85	80	75	70	65	61	56	52	48	44	39	35	31	28	24	20	17	13	10	6	3							
70	100	95	90	86	81	77	72	68	64	60	55	52	48	44	40	36	33	29	26	23	19	16	13	10	7	4	1				
75	100	95	91	87	82	78	74	70	66	62	58	55	51	47	44	40	37	34	31	27	24	21	19	16	13	10	7	5	2		
80	100	96	92	87	83	79	75	72	68	64	61	57	54	51	47	44	41	38	35	32	29	26	23	20	18	15	13	10	8	6	3
85	100	96	92	88	84	80	77	73	70	66	63	60	56	53	50	47	44	41	38	36	33	30	28	25	22	20	17	15	13	11	9
90	100	96	92	88	85	81	78	75	71	68	65	62	59	56	53	50	47	44	41	39	36	34	32	29	26	24	22	20	17	15	13
95	100	96	93	89	86	82	79	76	72	69	66	63	60	58	55	52	49	47	44	42	39	37	35	32	30	28	25	23	21	19	17
100	100	97	93	90	86	83	80	77	74	71	68	65	62	59	57	54	51	49	47	44	42	39	37	35	33	31	29	27	25	23	21

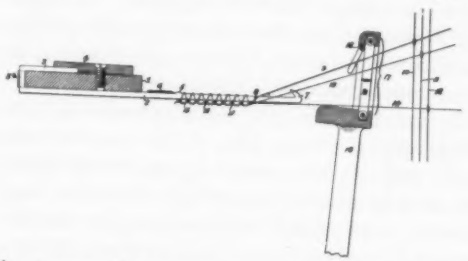
herewith given, and which is computed for this purpose the relative humidity may be read off direct. As for instance, if the temperature in the room was 100° F., according to the dry thermometer and the wet thermometer read 85° F., i. e., a difference of (100-85=) 15°, then follow the air temperture column down to the 100 mark, and then follow that line out to the right until the 15th space = 54 per cent. humidity.

So fully are the benefits arising from the proper degree of humidity recognized by cotton, worsted and knit goods manufacturers in recent years, that air moistening apparatus for regulating humidity has become a necessary part of the equipment of well organized mills.

HEALD'S CUT-PILE LOOM.

In this loom, in place of inserting pile wires across the width of the fabric under such of the pile warp threads as are raised for this purpose in the upper plane of the shed, the pile loops in Heald's loom are formed by carrying the pile warp threads over longitudinally extending pile loop formers, each pile thread being tied into the body structure of the fabric after the formation of each loop.

With reference to the accompanying illustration which is a diagram of the loop forming mechanism of this loom, numerals of reference indicate thus: 1 indicates a portion of the breast beam, and 2, the pile loop forming fingers, one of which is used for each pile warp thread or set of threads employed. Each of these fingers, 2, is bent L-shaped at its rear end, so as to embrace the rear portion of the breast beam, the portion 3 of it, and which overlaps the beam, being secured thereto by means of a clamp plate, 4, so that by loosening said plate, any one of the fingers can be removed and replaced. To prevent the fingers from being turned or twisted from their proper position, the vertical portion of each finger is fitted within a slot, 3^a, in the back of the breast beam. Each finger, 2, has in advance of the beam, 1, a shoulder, 5, behind which works a transversely extending knife, 6, consisting either of an endless band having continuous forward movement or a blade having back and forth reciprocating movement, so that the forward or cutting edge of said knife blade will sever the tops of



the loops of the pile warp threads as formed upon the finger, 2, as said loops are carried backwardly along said finger and over the lug, 5, by the action of the take-up mechanism of the loom.

Each finger, 2, has at the end a hook, 7, to prevent the pile warp threads from slipping from the same, having also in its upper edge some distance backwardly from said hook, 7, a recess, 8, which serves to catch and retain the pile warp thread when the latter is carried over the top of the finger, and thus hold the same closer to the "beating-up point" than if the thread was allowed to extend from the body of the fabric to the hook, 7.

With reference to the shed forming portion, as shown in our illustration, 9 indicates a pile warp thread, 10 its harness cord, 11 and 12 heddles controlling binding warps, 13 and 14, which are interwoven with the filling, 15, to form a body structure into which the pile warp threads, 9, are tied by engagement with some of the picks, 15, after the formation of each loop.

The lay, 16, of the loom has a peculiarly constructed reed, 17, viz.: in front of it is a comb bar, 18, the downwardly projecting teeth of which when said comb bar is in the position shown in our illustration, engage with the elevated pile warp threads, 9, so that by a lateral movement of said comb bar, 18, said pile warp threads can be caused to pass from their normal position on one side of the fingers, 2, to a position on the opposite side of the same, preparatory to being lowered on said opposite side of the finger, the comb bar being then retracted to its first position in readiness to engage the pile warp threads when next such engagement becomes necessary. After being lowered the warp

threads resume their normal position prior to being again raised, hence each pile warp thread is always lifted on one side of a finger and depressed on the opposite side of the same, and therefore follows the continuous spiral course, shown in the illustration.

To prevent the pile warp tnreads 9 from rising on the wrong side of the teeth of the comb bar, 18, the latter has a swinging as well as a lateral reciprocating movement, and the reed is provided with pockets for the reception of the teeth of the bar when the latter are in the retracted position, so that said teeth are shielded, and the rising warp threads 9 cannot pass upon the wrong side of either tooth.

When the pile warp threads, 9, have been fully raised, the teeth of the comb bar, 18, are projected, as shown in the illustration, so as to be free from engagement with the reed in order to permit of the lateral movement necessary for carrying the pile warp threads from side to side of the finger's 2.

After the tops of the pile loops on the fingers, 2, have been severed by the knife, 6, the cut pile fabric is free to pass beneath the breast beam of the loom and from there to and around the take-up rolls.

PRACTICAL POINTS ON THE SCOURING AND FULLING OF COTTON WORSTEDS.

Soap for cotton worsteds, especially such fabric structures of this division of textiles as contain delicate colors, is always a more or less important item on account of the various conditions which have a direct influence upon this subject. Again we must take into consideration the fact that a soap which will remove grease and dirt from any cloth, i. e., can be used with all kinds of fabric structures, does not exist; again there is no recipe which will be able to cover all cases. In order to get a fair idea of what kind of a soap to make for use in connection with these cotton worsteds, it will be well to investigate the constituents of soap, i. e., what we may find in it that will attack delicate colors by either bleeding them (rub-off), changing their shade, etc. This we will find to be either alkali or free caustic. The latter, if present in any quantity at all, is apt to make trouble for the finisher, for which reason a perfectly neutral soap should be used, and which will meet our requirements in every particlar.

Soaps for scouring and milling should be quite free from uncombined caustic alkali, but may with advantage contain a small amount, say 0.2 to 0.3 per cent. of free carbonate. They should not contain resin, and are preferably made from tallow, palm oil and olive oil.

The presence of free caustic alkali in soap may be recognized by drying a small sample and then extracting with alcohol, which dissolves the soap and caustic alkali, but does not dissolve any carbonated alkali which may be present. The presence of caustic alkali is therefore readily detected in the solution by the production of a pink color on adding phenol phthalein.

Free caustic alkali, if present, may be neutralized by adding the necessary amount of free oleic acid.

Resin may be detected by decomposing the soap with acid, dissolving the free fatty and resinous acids in acetic anhydride, and adding sulphuric acid, 100 degrees Tw., when, if resin is present, a reddish violet coloration will be produced.

The body of the soap should first be considered, as this has a very important bearing upon its usefulness, and also from the point of economy, since a soap which will not hold its body for any length of time, i. e., turn, will be expensive at any cost.

In connection with either fulling or scouring these cotton worsteds we must carefully avoid any tendency for them to felt during these processes, and as the body of the soap is closely connected with the felting capacity of the wool fabric it will be readily understood that it is most important for the finisher to look carefully after this item. The heavier the soap the more its felting capacity, and therefore it is important that soap for cotton worsteds is made as light as possible, consistent with good work, since in connection with the construction of these fabrics, the filling, and possibly only a very small amount of the warp is wool, i. e., has felting properties, the rest being cotton, and this small amount of wool has got to be brought

out clear. From 1 1/2 to 2 oz. of soap to the gallon will as a rule be found sufficient, the proper amount depending largely upon the kind of soap we have to use. In connection with a good palm oil soap, or a tallow soap, having possibly enough body-making quality in it, perhaps 1 oz. will be sufficient to the gallon; however, cheaper grades of soap, like cottonseed oil soap, or other grease soap of less consistency than palm oil or tallow, will make the use of 1 1/2 or perhaps 2 oz. per gallon necessary. Percentages quoted, however, must not be considered as a fast rule, the proper strength to use being best determined by actual trial, for the soap to be used in connection with these fabrics should never be stiff, like common soft soap, when perfectly cold, but should be liquid. Adding from 1 1/2 to 2 lbs. of sal-ammoniac to every 50 gallons of such a scouring soap will be found of value, both as to its body as well as to its cleansing power.

Another important item to be determined by the finisher is the proper amount of alkali to put in the soap. This we will always find a most difficult task for any finisher in connection with a new style of fabrics, i. e., a range of goods constructed on an entirely different basis than he has ever dealt with. Cotton yarn colored, is seldom fast to any large quantities of alkali, except if dyed with such colors as are known and sold as "Fast to milling," and it is for this reason important to use alkali sparingly, sal-soda being well suited. Although the quantity of it to be used may seem large, compared with soda ash or ammoniated alkali, yet by actual test it will be found that even a greater strength of it may be used with less danger to the colors of the fabric bleeding.

Sal-soda certainly is the better product to use on delicate colors, but if alkali is necessary, 1 1/2 oz. should be amply sufficient, whereas 6 oz. of sal-soda to the gallon may be required. Dissolve the soap first and then add alkali and then boil mixture at least for two hours, then fill up tank with water, and allow soap to become cold, after which add the sal-ammoniac. Never use warm soap or even warm water on cotton worsteds with delicate colors, provided you don't want them to run or rub off.

When with soap thus prepared, it should be found during scouring that the goods do not lather properly, it will show that the soap is not taking hold freely, and that therefore it will have to be made stronger; this, however, will not often be the case. As soon as the lather becomes dirty, it had best be drawn off and fresh soap applied, thus preventing the staining of any colors in the fabric structure. Handling cotton worsteds cold will also prevent any colors from bleeding or getting stained; however, in this case it is well and safe to add another pail of soap to each piece, and let them run five or ten minutes extra, when the gates may be opened and the water turned on for the rinsing. After rinsing the pieces for about one-half hour, shut off the water and drain the goods for a few minutes, then shut gates of the washer, and give each piece two pailfuls of salt water, made by dissolving a peck of rock salt in a barrel of water. Allow the goods to run in this liquor for about five minutes, and then take them out without opening the gates, and hydro extract, and dry them as soon as possible, thus preventing the colors from running, and thus be the cause of cloudy fabrics. Provided you ever meet with cotton worsteds, which will not stand this procedure, then the use of fuller's earth in place of soap is the remedy.

WARDWELL'S DROP BOX PICKER.

By what is termed drop box picker, we understand such as used in connection with drop box looms, i. e., looms calling for more than one shuttle. Of the accompanying illustrations, Fig. 1 is a top plan of this loom picker, partly shown in section; and Fig. 2 a section on the line, 2-2, of Fig. 1.

1 indicates a metal frame which is guided on the shuttle box spindle, 2. The said metal frame, 1, is provided with a perforation, 3, through which is inserted the picker-stick, 4.

Through the frame, 1, is made a longitudinal perforation in which is inserted a sleeve, 5, made of rawhide or metal, and which is guided on the shuttle box spindle, 2. The ends of sleeve, 5, are made with suitable flanges, 6, adapted to be received in

end recesses, 7, in the frame, 1, and are secured to the latter by means of rivets, 8.

Integral with the frame, 1, are the side projections, 9, each of which has on its interior portion a cut-away recess, 10. Projections, 9, are connected by a horizontal reduced web, 11, made integral with the side projections, 9, and to both of which is secured the laminated picker-head, made of rawhide, leather, or suitable material. This picker-

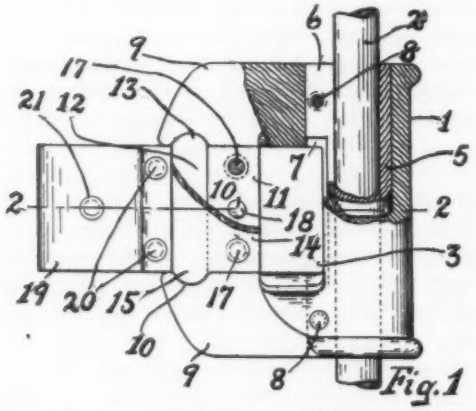


Fig. 1

head is composed of a middle rawhide or other suitable sheet, 12, having end projections, 13, fitting into the recesses, 10, on the interior of the frame projections, 9. On opposite side of the middle sheet, 12, are located rawhide, or other suitable sheets, 14, having end projections, 15, fitting into the recesses, 10, on the interior of the frame projections, 9.

On the outside of each sheet, 14, is located a filler, 16. The side sheets, 14, are secured to the web, 11, by means of the rivets, 17.

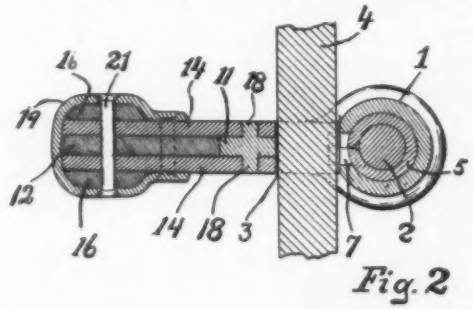


Fig. 2

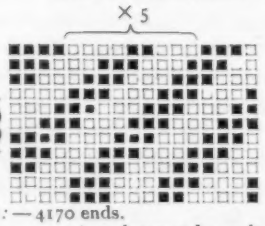
For the purpose of still further securing the sheets, 14, to the web, 11, projections, 18, on the latter are made integral with said web, adapted to fit into corresponding perforations in the sheets, 14.

For the purpose of securing the laminated sheets together they are inclosed with a rawhide cover, 19, the ends of which are secured to the laminated sheets, 12, 14, by means of rivets, 20. For the purpose of securing the cover to the laminated sheets, 12, 14, and fillings, 16, they are firmly secured together by means of a rivet, 21.

By this arrangement the frame is provided with a compact, strong and durable picker-head that can readily be made in parts and secured to the frame in a very substantial manner. If said picker-head should become defaced or broken, a new one can readily and at a low cost be attached to the frame. By lining the perforated head with a removable metal or rawhide sleeve or bushing, 5, the spindle, 2, as well as the perforation in the frame is prevented from being worn or defaced. If the bushing should wear out it can readily be replaced with another at little expense.

NOVELTIES FROM FOREIGN SOURCES.

Worsted Diagonal Suiting.



Complete Weave.
Repeat 65 × 77.

Warp: — 4170 ends.

Reed: — 21 × { 21 dents and 3 ends / 1 dent and 2 ends }

22 dents containing 65 ends.

Dress: —

2 ends, 2/26's worsted, dark blue 1 end, 2/36's worsted, dark blue twisted with (pearl) silk	× 6 =	18 ends.
2 ends, 2/26's worsted, dark blue	=	2 ends.
2 ends, 2/36's worsted, dark blue twisted with (pearl) silk 4 ends, 2/26's worsted, dark blue	× 4 =	24 ends.
2 ends, 2/36's worsted, dark blue	=	2 ends.
2 ends, 2/26's worsted, dark blue 1 end, 2/36's worsted, dark blue twisted with (pearl) silk	× 6 =	18 ends.
1 end, 2/26's worsted, dark blue	=	1 end.
2 ends, 2/26's worsted, dark blue 1 end, 2/36's worsted, dark blue twisted with (pearl) silk	× 6 =	18 ends.
2 ends, 2/26's worsted, dark blue	=	2 ends.
2 ends, 2/36's worsted, dark blue twisted with (pearl) silk 4 ends, 2/26's worsted, dark blue	× 2 =	12 ends.
2 ends, 2/36's worsted, dark blue twisted with (pearl) silk	=	2 ends.
1 end, 2/52's worsted, brown, 2-fold	=	1 end.
3 ends, 2/26's worsted, dark blue	=	3 ends

2 ends, 2/36's worsted, dark blue twisted with (pearl) silk = 2 ends.
4 ends, 2/26's worsted, dark blue = 4 ends.
2 ends, 2/36's worsted, dark blue twisted with (pearl) silk = 2 ends.
2 ends, 2/26's worsted, dark blue
1 end, 2/36's worsted, dark blue twisted with (pearl) silk } × 6 = 18 ends.
1 end, 2/26's worsted, dark blue = 1 end.

Repeat of pattern: 130 ends.

Filling: — 67 picks per inch, arranged thus:

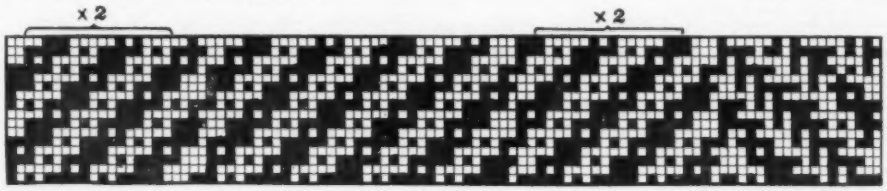
39 picks, 2/26's worsted, dark blue.
1 pick, 2/52's worsted, brown 2-fold.
114 picks, 2/26's worsted, dark blue.

154 picks. Repeat of pattern.

Finish: — Worsted finish, 56 inches wide.

Worsted Trousering.

Complete Weave. Repeat 128 × 16.



Warp: — 6065 ends, 26 harness, fancy draw.

Reed, 24½ × {
9 dents × 4 ends = 36 ends.
1 dent × 2 ends = 2 ends.
8 dents × 4 ends = 32 ends.
1 dent × 2 ends = 2 ends.
9 dents × 4 ends = 36 ends.
1 dent × 2 ends = 2 ends.
4 dents × 4 ends = 16 ends.
1 dent × 2 ends = 2 ends.

33 dents. 128 ends.

Dress: —

2 ends, 2/36's worsted, black
2 ends, 2/36's worsted, black and gray twist } × 9 = 36 ends.
2 ends, 2/36's worsted, black = 2 ends.
2 ends, 2/36's worsted, black = 2 ends.
6 ends, 2/36's worsted, black and gray twist
6 ends, 2/36's worsted, black } × 2 = 24 ends.
6 ends, 2/36's worsted, black and gray twist = 6 ends.
2 ends, 2/36's worsted, black = 2 ends.
2 ends, 2/36's worsted, black
2 ends, 2/36's worsted, black and gray twist } × 9 = 36 ends.
2 ends, 2/36's worsted, black = 2 ends.
2 ends, 2/36's worsted, black = 2 ends.
1 end, 2/36's worsted, black and gray twist
1 end, 2/36's worsted, black } × 2 = 4 ends.
6 ends, 2/36's worsted, black = 6 ends.
1 end, 2/36's worsted, black and gray twist
1 end, 2/36's worsted, black } × 2 = 4 ends.
2 ends, 2/36's worsted, black = 2 ends.

Repeat of pattern: 128 ends.

Filling: — 92 picks per inch, all 2\36's worsted, black.

Finish: — Worsted finish, 56 inches wide.

Cheviot Worsted Suiting.

Complete Weave. Repeat 4 × 4.

Warp: — 2570 ends.

Reed: — 18 × { 30 dents and 2 ends / 1 dent and 3 ends } = 66 inches wide in loom.

31 dents containing 63 ends.

Dress: —

1 end, A = 1 end.
1 end, B = 1 end.
1 end, C
1 end, D × 2 = 4
1 end, C = 1
1 end, E = 1
1 end, C = 1
1 end, E = 1
1 end, C
1 end, D × 2 = 4
1 end C = 1
1 end, B = 1
1 end, C = 1
1 end, B = 1
} × 3 = 48 ends.
1 end, C
1 end, D × 2 = 4 ends.
1 end, C = 1 end.
1 end, E = 1 end.
1 end, C = 1 end.
1 end, E = 1 end.
1 end, C
1 end, D × 2 = 4 ends.
1 end, C = 1 end.

Repeat of pattern: 63 ends

Filling: — 34 picks per inch, arranged thus:

1 pick, B = 1 pick.
1 pick, C
1 pick, E × 2 = 4 picks
1 pick, C
1 pick, D × 2 = 4 picks
} × 7 = 56 picks.
1 pick, C
1 pick, E × 2 = 4 picks.
1 pick, C = 1 pick.
1 pick, D = 1 pick.

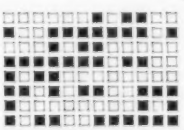
Repeat of pattern: 63 picks.

Description of yarns used:

A = 3-fold 3/80's cotton, pearl, mercerized.
B = 2/45's worsted, black, twisted with two ends. 2/60's cotton, white, mercerized.
C = 2/26's worsted, dark green mix and white twist; twisted over with single 26's worsted dark green mix.
D = 2/26's worsted, gray and white twist, twisted over with single 26's worsted gray.
E = 2/26's worsted, black and white twist, twisted over with single 52 worsted light gray.

Finish: — Worsted Cheviot finish, full slightly during scouring, clip on shear, press and steam 56 inches finished width.

Worsted Suiting.



Complete Weave. Repeat 12×8.

Warp:—9540 ends.

Reed:—24×6=66 inches.

Dress:—

1 end, 2/64's worsted, black, twisted over with 300/2's white silk
1 end, 2/64's worsted, black and white
1 end, 2/64's worsted, black and gray } × 2 = 6 ends.
2 ends, 2/64's worsted, black
1 end, 2/64's worsted, black and gray } × 2 = 6 ends.
2 ends, 2/64's worsted, green = 2 ends.
1 end, 2/64's worsted, black and gray = 1 end.
2 ends, 2/64's worsted, black = 2 ends.
1 end, 2/64's worsted, black and gray = 1 end.

1 end,	2/64's worsted, black, twisted over with 300/2's white silk	
1 end,	2/64's worsted, black and white	× 2 = 6 ends.
1 end,	2/64's worsted, black and gray	
2 ends,	2/64's worsted, black	= 2 ends.
7 ends,	2/64's worsted, black and gray	= 7 ends.
2 ends,	2/64's worsted, black	= 2 ends.
10 ends,	2/64's worsted, black and gray	= 10 ends.
2 ends,	2/64's worsted, black	
1 end,	2/64's worsted, black and gray	× 3 = 9 ends.
1 end,	2/64's worsted, black, twisted over with 300/2's white silk	= 1 end.
1 end,	2/64's worsted, black and white	= 1 end.
4 ends,	2/64's worsted, black and gray	= 4 ends.
1 end,	2/64's worsted, black, twisted over with 300/2's white silk	= 1 end.
1 end,	2/64's worsted, black and white	= 1 end.
1 end,	2/64's worsted, black and gray	= 1 end.
2 ends,	2/64's worsted, black	
1 end,	2/64's worsted, black and gray	× 3 = 9 ends.
9 ends,	2/64's worsted, black and gray	= 9 ends.
2 ends,	2/64's worsted, gray	= 2 ends.
7 ends,	2/64's worsted, black and gray	= 7 ends.
2 ends,	2/64's worsted, black	= 2 ends.
1 end,	2/64's worsted, black and gray	= 1 end.
1 end,	2/64's worsted, black, twisted over with 300/2's white silk	
1 end,	2/64's worsted, black and white	× 2 = 6 ends.
1 end,	2/64's worsted, black and gray	
2 ends,	2/64's worsted, black	
1 end,	2/64's worsted, black and gray	× 2 = 6 ends.
2 ends,	2/64's worsted, orange	= 2 ends.
1 end,	2/64's worsted, black and gray	= 1 end.
2 ends,	2/64's worsted, black	= 2 ends.
1 end,	2/64's worsted, black and gray	= 1 end.
1 end,	2/64's worsted, black, twisted over with 300/2's white silk	
1 end,	2/64's worsted, black and white	× 2 = 6 ends.
1 end,	2/64's worsted, black and gray	
2 ends,	2/64's worsted, black	= 2 ends.
7 ends,	2/64's worsted, black and gray	= 7 ends.
2 ends,	2/64's worsted, black	= 2 ends.
10 ends,	2/64's worsted, black and gray	= 10 ends.
2 ends,	2/64's worsted, black	
1 end,	2/64's worsted, black and gray	× 3 = 9 ends.
1 end,	2/64's worsted, black, twisted over with 300/2's white silk	= 1 end.
1 end,	2/64's worsted, black and gray	= 1 end.
4 ends,	2/64's worsted, black and gray	= 4 ends.
1 end,	2/64's worsted, black, twisted over with 300/2's white silk	= 1 end.
1 end,	2/64's worsted, black and white	= 1 end.
1 end,	2/64's worsted, black and gray	= 1 end.
2 ends,	2/64's worsted, black	
1 end,	2/64's worsted, black and gray	× 3 = 9 ends.
9 ends,	2/64's worsted, black and gray	= 9 ends.
2 ends,	2/64's worsted, gray	= 2 ends.
7 ends,	2/64's worsted, black and gray	= 7 ends.
2 ends,	2/64's worsted, black	= 2 ends.
1 end,	2/64's worsted, black and gray	= 1 end.

Repeat of pattern: 186 ends.

Filling: — 110 picks per inch, arranged thus:

1 pick, 6 run, woolen yarn.
1 pick, 2/64's worsted, black.

2 picks. Repeat of pattern.

Finish: — Worsted finish, 56 inches wide.

CARBONIZING WOOL, RAGS AND CLOTH.

CARBONIZING WITH REFERENCE TO WOOL,

has for its purpose the chemical removal of vegetable impurities, like burrs, with which the wool in question is heavily contaminated, and which cannot be removed successfully or economically in a mechanical way.

The process of carbonizing is based on the different behavior of animal and vegetable fibres in the presence of certain chemicals, such as dilute sulphuric acid, gaseous hydrochloric acid, and certain metallic salts, such as the chlorides of aluminum and magnesium.

The sulphuric acid process consists in steeping the burry wool in a bath of the acid with the strength of 2° to 4° Tw. until saturated, then squeezing and drying. During the drying, the acid on the fibres becomes more concentrated and the vegetable matter present is disintegrated or practically burned up, and is afterwards removed in the form of dust by shaking or beating. This process is known as liquid or wet carbonizing.

Dry or gas carbonizing consists in treating the burry wool with hydrochloric acid gas in a heated chamber, the action of the acid being the same on the vegetable matter as with sulphuric acid.

Another method of carbonizing is by the use of certain metallic salts, such as magnesium or aluminum chlorides, etc., instead of acid.

When using chloride of aluminum, the wool to be entered in a chloride of aluminum bath from 6° to 7° B., and carefully handled, and the carbonizing fluid permitted to operate for a few hours. The wool is then taken out, hydro-extracted, and dried at a medium temperature, and entered into the carbonizing chamber, which is heated to 194° F., and in which the wool is left for one hour, during which time the vegetable matter is disintegrated. The remains of the vegetable fibres, i. e., dust is then removed from the wool by beating, after which the wool is washed in soft water with fuller's earth, and then the soluble chloride of aluminum is readily removed. This process is not as liable to be injurious to the fibre as the acid processes.

CARBONIZING WASTE OR RAGS

has for its object the separation or destruction of all vegetable fibres, as found in a lot of woolen material, and thus eliminate them from the wool fibres. The sulphuric acid process is used amost exclusively on account of its comparative cheapness.

The mass of rags or waste is steeped in a solution of sulphuric acid, and then heated in an enclosed chamber. This drying process evaporates the water and leaves the sulphuric acid in a very concentrated form, the effect of which is to destroy the vegetable

fibre, and leave only cinders or dust, which disappears when the material is afterwards subjected to a thorough washing, any acid on the stock being then removed by this process at the same time.

CARBONIZING CLOTH.

This process has for its object to liberate all vegetable impurities from woolen cloth. Although carbonizing should be practiced in connection with the stock, before it is converted into yarn, as previously explained, yet in many instances it is preferred to be done in the woven cloth. The carbonizing of goods will naturally omit their having to be speck or burr dyed. The common way of carbonizing is by means of exposing the cloth for some time to the action of a sulphuric acid bath, and then dry the cloth under excessive heat, which then will reduce all vegetable matter to such a state of carbon that, with a vigorous beating, it will pass off as dust.

The carbonizing liquor for this process is made by adding sufficient sulphuric acid to the water with which the tank is filled, to make the liquor register 5° B., after which the goods are entered and well covered with the liquor and left there for about twenty-five minutes according to condition of the cloth to be treated. When ready to remove the goods, one of the ends is passed through a set of squeeze rolls as fastened to the tank, and thus any surplus liquor squeezed out and saved for future use in the tank. It must be mentioned here, that all the metal parts of the tank must be of bronze, for if not, the acid will destroy them; the tank also should be lined with lead, or if of metal, it must be of a non-corrosive kind. As soon as the goods leave the squeeze rolls of the tank, they should at once pass (guided into by means of a drum situated directly above the extractor) to the extractor with no more handling than absolutely necessary. This extractor must be acid proof, and its drainage such that all liquor extracted from the goods, returns to the tank, and is thus re-used. Always be careful to keep the acid bath in the tank at its proper strength, by adding from time to time as required, more acid to it.

From the extractor the goods are taken to the drying room to undergo the baking process, i. e., transfer the vegetable matters as now completely saturated with sulphuric acid, by means of drying under excessive heat, into carbon—dust, and in which state said vegetable impurities have to leave the cloth.

The drying room is supplied with numerous steam pipes in order to be able to quickly raise the heat to a high point, said steam pipes being so placed as not to interfere with the goods which are loosely hung up, in any way, to get the heat at all points of the goods. After being hung up, the room is closed and the steam turned on, and the heat run up to at least 175° F., since at that point only, the baking process will be completely accomplished.

In other words, the strength of the acid bath, as well as the heat in the drying chamber, must be both up to the required point for perfect carbonizing.

In some mills can dryers, as are used in connection with the drying of cotton goods, are employed in place of a drying chamber. Such can dryers consist of a series of metal drums, kept at a uniform temperature by a constant steam supply. These drums are driven (rotated) by power and the goods passed over them, and thus dried and in turn baked.

After thus carbonizing the vegetable impurities in the cloth, they in turn have to be removed, and which is done either by dry beating the cloth, or in case with bad pieces, by means of a heated fulling mill; this being a fulling mill supplied with steam pipes, placed out of the way of the run of the cloth.

Running the goods in such a hot fulling mill, for about one-quarter hour or less, will remove every trace of carbonized vegetable fibre, provided the process itself was done well.

The next thing to be done is to send the goods to the washer and give them a bath in a solution of soda and water for about twenty-five minutes, in order to neutralize the acid, after which rinse them well, adding fuller's earth to the latter procedure will greatly assist. Previous to taking the goods out of the washer it will be advisable to ascertain if neutralizing has been thoroughly accomplished. If acid still remains in the goods,

they will feel slippery, and then another soda bath, to be followed with a rinsing, has to be given to the goods.

THE SIZING OF COTTON YARNS.

Sizing is one of the most important departments in the cotton mill, since upon it depends production and quality of work turned out, requiring for this reason:

1st. The proper ingredients to be used.

2nd. The greatest care and attention on the part of the operator.

3rd. The most approved machinery; for unless warp yarn is properly sized and handled, it will not weave well.

Sizing is usually done in the yarn, for, although a similar process is used in connection with woven cloth, in the process of finishing the latter, it is then generally termed starching or filling and not sizing.

There are several reasons why yarn should be put through this process, the principal object being to form a film on the surface of the yarn prior to weaving, which besides giving additional strength to the thread, in order to withstand the tension necessary to be given to it in its passage from the warp beam to the fell of the cloth, at the same time prevents the loosely adhering fibres from rubbing up, and thus causing what is generally known among weavers as "buttoning," which is produced by rubbing action of the heddles and the reed during weaving, especially when dealing with single yarn and more so in connection with high textures.

Another important reason for sizing, in connection with a great many fabrics, is to give additional weight to the goods, produced by the addition of some percentage of foreign matter to the yarn. The process consists in saturating the warp yarn with some suitable adhesive material of considerable specific gravity, the constituents of the composition depending, amongst other things, on the use which is to be made of the yarn and the class of fabric which has to be produced from it.

Yarns for bleaching or dyeing should contain very little size, and then only the best quality of size, since otherwise the goods when finished, will be faulty in appearance, for the reason that the fibres and the floury admixture are differently affected in these processes.

Soft twisted yarns absorb size better than hard twisted yarns, and therefore, a soft twisted thread, produced from a strong and coarse fibred cotton, should be used when heavy sizing is necessary.

The size must be of such a character that it will adhere firmly to the yarn, both while wet or dry and retain this attachment to the yarn during weaving. For this reason, the size whether for light, medium or heavy sizing, must therefore be of uniform thickness and consistency throughout, in order to saturate the yarn thoroughly.

The quantity and strength of the size to be put on to yarn depends upon circumstances and can only be regulated by experience; but when this is once determined upon, the operator of the slasher must look after and keep the temper of the size regular and at one thing. The yarn after being sized must not be allowed to go on to the loom beam until perfectly dry. When the slasher is standing, the yarn should be taken out of the boiling size, by winding the roller that keeps the yarn submerged out of the size box, since otherwise the ends of that portion of the warp thus remaining in the size box will all get glued together.

The weight of size which can be added to a yarn depends upon the class of yarn, the class of cloth into which it has to be woven, the amount of twist in the yarn, the kind of size used and the manner in which the same is applied, and in turn is divided into four kinds of sizing, viz:

Light sizing.....any weight up to 20%
Medium sizing...any weight from 20 to 50%
Heavy sizing...any weight from 50 to 100%
Extra Heavy sizing,
any weight from 100 to 150%

The materials used in sizing may be classed under different headings, according to their respective properties; but this classification cannot be strictly adhered to, as some bodies come under two or more of the following headings:

1st. Adhesive bodies.
2nd. Softeners.
3rd. Weighting bodies.

4th. Antiseptics.

1st. Adhesive bodies: These are flours of some sort, such as corn, farina, wheat, rice, etc., the first two, corn starch and farina being the ones most frequently used, some mills preferring one kind, some the other. Both flours refer to light sizing and require the addition of a softener, to counteract the harshness they give to the yarn if used alone.

Farina or potato starch as thus indicated is produced from the potato, yielding a thicker paste than other starches. The chief constituent of farina is water, the same constituting about 70 per cent. of the whole, the proportion of starch being about 20 per cent.

The farina flour, although not quite so soft to the touch as wheaten flour, in its appearance it is bright and glistening, with a crisp, sharp feel. These characteristics of farina flour, when used as a sizing compound, are imparted to the fabric, but on account of its thickening nature no very great amount can be put in. Generally it is used as a help to some other adhesive material, or it may be used alone in light sizing where it is desired that the yarn only is to be strengthened and not weighted.

It is cheap, and although strongly adhesive, as before mentioned it requires, in order to counteract the effect of its crispness, a softener, such as tallow or wax.

Wheat flour is extensively used for "heavy sizing," since it fixes weighting substances well and at the same time leaves the warps less harsh than other starches.

In the best wheaten flour, the ingredients mostly used are:—

1st.	Starch	70%
2nd.	Water	13%
3rd.	Gluten	8%
	Total amount	91%

although the percentages vary in different countries to climatical conditions, etc.

Rice starch is much crisper than wheaten flour; it produces a thicker paste, but is less adhesive than the latter, and for heavy sizing the wheat flour is often adulterated with it. For light sizing it can be used alone, as a much smaller quantity will produce a thicker paste than that of wheat flour.

Sago furnishes a thick size and similar to rice flour can be used by itself for light sizing purposes, whereas for heavier sizing other flours must be added.

The chief properties of a good flour for size purposes are whiteness and adhesiveness. Since adulteration of flour is a frequent occurrence met with, we must consequently be continually on the look-out for such in order not to buy an article artificially compounded. Cheap flours, the same as any other article, will be always found the most expensive in the end especially if the affair refers to light sizing.

2nd. Softening bodies: The adhesive bodies previously mentioned, if used alone more so if combined with weighting bodies, will make the yarn hard and harsh, besides when dry brush or crumble more or less off the yarn. If yarn is made harsh by the size, this feature enters into the cloth, and if the size brushes off by friction on the threads, it will be readily seen that the advantages aimed at in sizing have become lost. To avoid such results, substances technically termed softeners, are added into the mixing, these softeners being of an oleaginous character.

Tallow is the most common softener used, there being mutton and beef tallow (although it may also be obtained from other animals), and of which beef tallow is the better of the two, as it is not so liable to become rancid as mutton tallow. Tallow varies considerably in color, freedom from gritty matters, melting point, smelling, etc., however it is easy to distinguish good from bad. Tallow, exposed to the atmosphere, should not darken in color, for if it does, it is a sign of inferior quality and should be promptly rejected. The same with rancid tallow which on account of its odor will be readily detected. A good valuable tallow should not contain water to any perceptible degree, since this will reduce its softening properties. This adulterant, as a rule can be detected by the feel, but if in doubt liquefy a sample of it and when the water and oil will show itself distinctly. A high melting point, about 110° F., is also a necessary feature for a good tallow.

Lard is the fat derived from the intestines of pigs, and has a lower melting point than

tallow, being at the same time generally darker in color, containing more water and all around, less care is taken in its manufacture. It is a less prominent softening agent than tallow.

Castor oil is a thick viscid oil, of a brown color when in the crude state, and is produced from plants growing in the East and West Indies and South America, being extracted from the seeds by pressure in the cold, and assisted occasionally by heat. Its use as a softening agent is somewhat restricted on account of its price. It forms the basis of some good sizing compounds.

Glycerine is one of the waste products from soap manufacture, and remaining in the spent lye when the soap has been salted out. It is a dark brown viscid liquid, with a sweet taste. It is a good softening agent, however, its use is restricted for the reason that if used in quantities it gives the cloth a sticky feel.

Other softening agents sometimes used are: Japan wax, which gives most excellent results, but is rather expensive; Parraffin wax, which is cheaper than the former, but cannot be used when cloth later on has to be dyed, bleached or printed, owing to its color and chemical action. Soap is also very frequently used as a softener, although its true action when used for this purpose is not generally known. Soap besides being a softener also has the power of making China clay boil thinner. However, there are also objections to the use of soap in size mixings, viz.: the same cannot be used to any extent in mixings which contain antiseptics without making the size lumpy; and, soap being of a frothy nature, it will rise in a scum or froth in the boiling vat. Soft or hard soaps, if used, must be of good quality and not dark in color. If soap is to be used, add only a small amount, and that to the China clay when the latter is being boiled separately from the other ingredients.

There is also a class of patent softeners in the market trading in many instances under high sounding names. In most cases the name being the greatest thing about it, some of them being composed of the most veritable rubbish, and in instances loaded excessively with water. Never use any of these preparations without first consulting a competent chemist, in order to ascertain whether its use will be economical or not.

3rd. Weighting bodies: Among these we find China clay or kaolin; baryta, or heavy spar; French chalk, or talc; plaster of paris, or gypsum; steatite, or soapstone; sulphate of soda, or glauber's salt; magnesium sulphate, or epsom salts; and barium chloride.

The principal ingredient in use is China clay or kaolin, which is a white or greyish-white body, having a soft, smooth feel to the fingers when rubbed. It is only found in few countries, and is the result of decomposition of felspathic rocks. It is an aluminum potassium silicate, and contains naturally 12 to 13 per cent. moisture on the air dried sample. The qualities of this body upon the market are very varied, and it is not always the whitest and the best looking variety that is the purest.

Glauber's salts or sulphate of soda are generally used along with epsom salts, and the results obtained are somewhat similar, except that glauber's salt hardly gives the harsh feel of epsom salts.

Calcium chloride is produced in large quantities as a waste product in the manufacture of bleaching powder, and also is a by-product in a great many other processes. It is usually run to waste, and very little of it finds its way into commerce.

Chloride of calcium is not much used by itself for sizing purposes, but is frequently mixed with magnesium chloride and zinc chloride for purposes of adulteration, it, however, has the quality of keeping the yarn moist during the weaving, when china clay is used. It should, however, never be employed alone.

Chloride of magnesium is a very powerful deliquescent substance, and it seems rather remarkable that it is often considered as an antiseptic. Its use is principally for adding to size which contains a large percentage of china clay, in order to prevent the size from becoming too dry and the clay rubbing off in the weaving process. However, never use it alone with soap, as they mutually decompose one another, producing magnesium soap and common salt. It contains, besides clay or silicate of alumina, silicate of potash and also free silica, mica, etc. When it is separated

from free silica and undecomposed felspar, its average chemical composition is: silica, 47 per cent., alumina, 40 per cent., water, 13 per cent.

China clay varies much in quality, and for sizing purposes, it is essential that it should be free from any gritty matter (especially so if used for finishing cloth since they would be apt to produce a rent in the cloth when passing the nip of pressure rolls). If it is boiled alone with water, it appears to be thick, and as the bubbles of steam are disengaged they project the mud from the vessel and spatter it about. This action may be stopped if soap, tallow and magnesium chloride be added, and the resulting mixture appears less thick, and will boil evenly without spitting.

Magnesium sulphate, or epsom salts is also used for the purpose of weighting. The principal use of magnesium sulphate is in finishing Oxford shirting and similar class of goods, but since it gives a very harsh feel it is well to use some softener along with it to counteract this harshness.

(To be continued.)

A GERMAN DYEING APPARATUS.

Of the accompanying illustrations, Fig. 1 is an elevation and partial section of an apparatus for dyeing cotton in the sliver by means of perforated sockets or holders, and Fig. 2 a detail drawing.

Examining our illustration, Fig. 1, we find a spirally bent pipe is located in a vessel a, the coils of which lie vertically above one another, and are provided at both sides with attachment nozzles, h, for connecting perforated holders, e Fig. 2, which are closed at one end, and at the other end are each provided with a plate, g. These holders also have each a head piece, f, at the end, which is provided with the plate, g. These head pieces have a tapering bore, k, in which the ends of the attachment nozzles, h, are inserted. Revoluble keys, l, are arranged on the attachment nozzles, which are adapted to engage, by means of projections, m Fig. 2, over the edges of the holder heads, f, such edges being provided with inclined planes. The closed ends, t, of the holders, e, rest on supports arranged on the inner faces of the walls of the vessel, a.

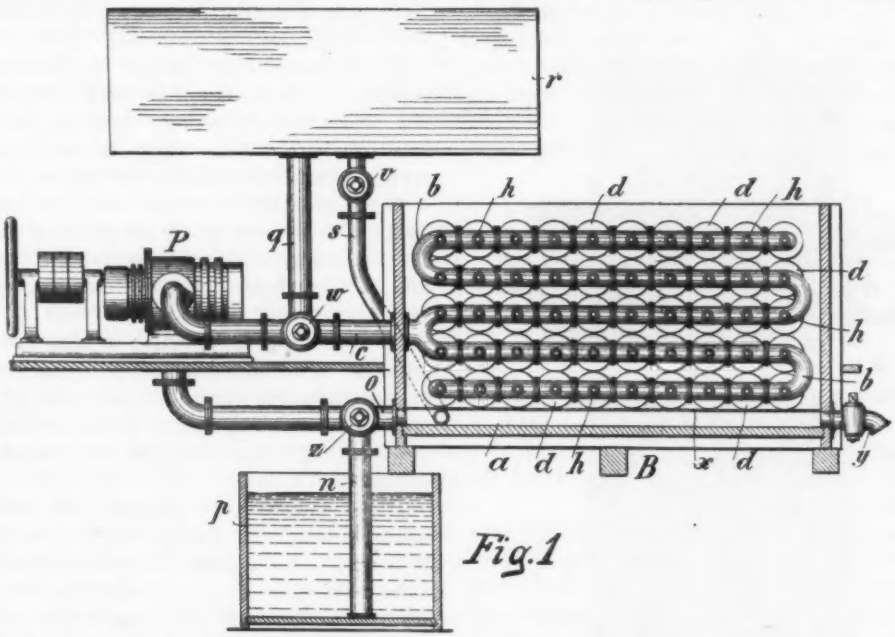


Fig. 1

The piping, b, Fig. 1, is connected with a pump, p, by means of a pipe, c, which pump in turn is connected by means of a pipe, o, with the vessel, a, the pipe, n, branching off from the pipe, o, which is immersed in a dye bath vat, p.

The pipe, c, is connected by a pipe, q, with a water washing tank, r, which is connected by a pipe, e, with the vessel, a. A three-way cock, w, is mounted at the point where the pipe, q, branches off the pipes, c, and a three-way cock, z, at the place where the pipe, n, branches off the pipe, o. A shut off valve, v, is provided on the pipe, s. Above the bottom of the vat, a, there is a sieve or straining bottom, x, and beneath the latter a discharge tap, y, on one wall of the vat, a. The closed ends, t, of the perforated holders, e, are provided with an extension bar (shown in Fig. 2 in dotted lines) and fit with the plate, g, attached thereto, directed downward into the sliver cam, where the sliver laps itself round the socket and their extension bars. After the sockets and their extension bars are surrounded along their entire length, the band of sliver is compressed

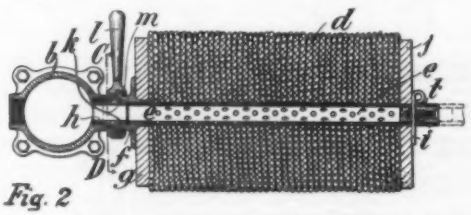


Fig. 2

to a minimum by means of disks, j, closed over the prolongations of the sockets, e, and maintained at this size by means of pins pushed through the closed ends, t, of the sockets beyond the disks, Fig. 2.

After the extension bars, which are now superfluous, have been removed, the sockets, e, together with the sliver band wound round them, are connected with the attachment nozzles, h, of the pipe, b, the socket heads, f, with their tapering bores, k, being brought onto the correspondingly formed ends of the attachment nozzles, and then by turning the revoluble keys, l, arranged on the attachment nozzles, the heads of the sockets are finally clamped on the attachment nozzles by the projections of the keys, l, sliding on the inclined planes of the edges of the socket head. The perforated sockets, e, are supported at their closed ends, t, on the supports, arranged on the inner faces of the walls of the vessel, a, and when the actual dyeing can then be proceeded with.

For dyeing process the dyestuff is drawn from its tank, p, by means of the pump, P, after the connection of the pipe, o, with the vessel, a, has been cut off by turning the three-way cock, z, and connection with the pipe, n, established, and the dye liquor is forced along the course, n o P c, into the piping, b, and in further succession through the attachment nozzles, h, into the perforated sockets, e, Fig. 2, and through the holes in the latter through the sliver, and then accumulates in the vessel, a.

If the three-way tap, z, of the pipe, n, is closed, and thus the connection of the pipe, o, with the vessel, a, is re-established, the dyebath may describe a continuous circulation, o P c b a.

If the pump, P, be caused to run in an opposite direction, the dye bath surrounding the sliver may be drawn through the sliver into the perforated sockets, e, and again returned to the vessel, a, by the course, b c P o.

If the connection of the vessel, a, with the dyebath container, p, be established through the three-way cock and the pipe, o, be shut off, the dye bath can flow directly into its vat, p.

The washing is effected in the following manner: When the pipe, n, is shut by means of the three-way cock, z, and the pipe, o, opened, the vessel, a, can then be filled with the washing liquor through the pipe, s, after closing valve, v.

Then, similarly to dyeing, the washing liquor is made to describe a circular course by means of the pump, and after the washing, if the pipe, c, be closed by means of the three-way cock, w, and the connection of the pipe, q, with the pump, P, established, the washing liquor may be forced back into the vessel, r, through the course, o P q. The perforated sockets, e, with the sliver band wrapped round them are then removed from the vessel, a, after having been washed, the sliver stripped off the perforated sockets, and the latter replaced by bars for the drying of the sliver, which after the drying is returned to the sliver cans for further treatment.

Experiments by the National Fire Protection Association have proved that the cylindrical cotton bale is distinctly superior to the square bale as a fire risk.

CORRESPONDENCE AND NOTES

Upon Textile Topics at Home and Abroad.

THE INFLUENCE OF TWIST ON THE CLOTH.

BY A. CRABTREE, in Textile Manfacturer.

III.

Although the influence of twist is most noticeable and important in twill fabrics, there is no doubt that almost all cloths are influenced to a considerable extent. There are, of course, many weaves which in some respects resemble twills, as, for example, certain forms of diaper, which may be considered as being made up of twill ribs running in different directions. There are also many weaves of a more ornamental character in which some portions of the fabric may be made up of diagonal or twill ribs of warp or weft. In all such cases the diagonal ribs will be influenced by the twist exactly as in ordinary twill fabrics. If these diagonal ribs play an important part in the ornament or in the cloth structure, the influence of the twist should receive consideration, as any possibility of improvement which may be made without increased cost is surely worth a little attention.

In a vast number of fabrics there is no twill or diagonal effect whatever, and it would appear that in such cases the direction of twist cannot materially influence the appearance. This, however, is by no means the case, as is well known. As an example of this class the calico weave may be studied, and it will be found that the direction of the twist in the yarns has a distinct influence on the appearance. The exact reason for this influence is less apparent than is the case with twill weaves. The usually accepted theory is that when warp and weft are twisted in opposite directions, the fibres of the two sets of threads lie across each other at the point of contact, i. e., the face of one thread, the back of the other; while the use of warp and weft spun in the same direction results in the fibres of the two sets of threads running in the same direction at the point of contact, and consequently lying somewhat closer together.

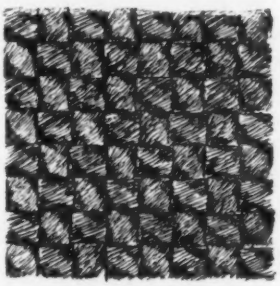


Fig. 19.

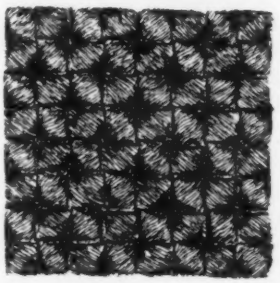


Fig. 20.

It is not quite clear how this is supposed to influence the appearance of the fabric, and in any case the writer cannot agree that there is any such bedding of the fibres to a sufficient extent to influence its appearance, and he is also disposed to consider that the influence which twist is stated by one or two writers to have on the feel of such cloth, is more imaginary than real. It is probable that the influence of twist on plain cloth or calico is due entirely to the effect of the twist on the reflection of light, as is the case

with twill weaves; but the effect in this case is of a different character.

Figs. 19 and 20 represent two plain cloths woven from similar yarns, except that in Fig. 19 ordinary weft has been used, and in Fig. 20 twist-way weft. The difference between the two is very noticeable. In the first case every thread coming to the surface of the fabric, whether warp or weft, reflects the light in the same manner, so that the arrangement of reflection on the surface of the fabric may be said to form a pattern repeating on one thread. In the second case, the lines of reflection from warp and weft run in opposite directions, giving a pattern repeating on two threads in each direction, or four threads in all. The effect of this is to give the fabric woven with ordinary weft a finer and more regular appearance than the other. Further than this, the arrangement of light and shade in Fig. 19 tends to show up each thread distinctly and separately, again tending towards a finer and more regular appearance; while in Fig. 20 the arrangements of light and shade tends to make the appearance of the individual threads somewhat indistinct, giving the cloth a rougher appearance, and making the threads appear somewhat thicker. The exact effect of these phenomena on the appearance of the actual fabric, when viewed with the naked eye, will depend largely on the construction of the cloth. If a cloth is firmly constructed and contains approximately the maximum amount of yarn that can be put into it, it is probable that ordinary weft will give the most satisfactory result, as it will cause the fabric to have a fine, smooth, and regular appearance, while twist-way weft will give a rougher and somewhat coarser effect. If, on the other hand, the fabric is of light construction, and it is desired to make it appear as full as possible, the best effect will probably be obtained with twist-way weft, as this will cause the yarns to appear thicker.

In choosing the weft for any particular fabric of this class it is only necessary to consider the requirements of the particular case; whether fineness and regularity are required on the one hand, or fulness and coarseness on the other. To obtain fineness and regularity, warp and weft must be spun in opposite directions, while to obtain fulness the yarns must be spun in the same direction.

A further aspect of the question which merits consideration is the effect of yarn quality on the influence of the twist. If, as the writer has attempted to show, the influence of the twist is entirely due to the formation of a diagonal line of reflection in the fabric, it only remains to consider briefly the manner in which this line of reflection may be affected by variations in the quality of the yarns.

The characteristics of the fibre itself must play a very important part in the influence of twist. As was shown in the first article, the line of reflection is made up of the separate reflections from the individual fibres, and to this fact the whole influence of twist is due. This being the case, it may be taken for granted that the finer the fibres the less will

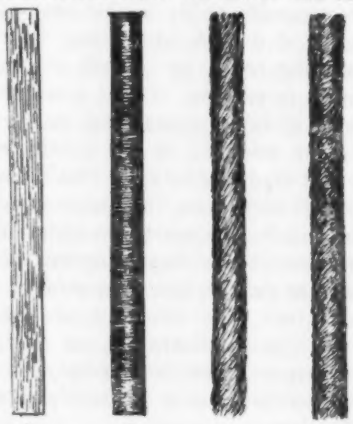


Fig. 21.

be the influence of twist in the cloth. The finer the fibres become the more nearly does the thread approach a smooth, solid structure. If this was carried to the extreme, the fibrous structure of the thread, and with it the individual reflecting surface of the fibres, would be lost.

The lustre of the fibre must also have a very great influence, as it will cause the line of reflection to be more or less bright according to the reflecting power of the fibres. A cloth woven from a lustrous fibre, such as silk, or even wool, would be more influenced by twist than one woven from cotton, provided the structure of the yarn was the same.

This structure is another point of importance, as much depends on the amount of twist put into the yarn and on the manner in which the fibres are arranged, whether single or folded, etc.

The effect of varying the amount of twist in yarns is illustrated in Fig. 21, in which several threads are shown in straight positions. A represents a thread without twist, B with the absolute theoretical maximum amount of twist, C an ordinary soft-twisted thread, and D an ordinary hard-twisted thread. The thread without twist appears to reflect light evenly from the whole surface, showing no pronounced line of reflection. The thread B, on the other hand, shows the line of reflection very clearly as a narrow line down the centre. It will be found that the greater the amount of twist the narrower will be the line of reflection, as illustrated by examples C and D. This is due to the sharper curve taken by the fibres in hard-twisted yarns, which causes each fibre to reflect light to the observer's eye from a shorter length. Fig. 22 shows a similar set of threads bent round a series of rods. In the thread A (without twist) the line of reflection runs straight

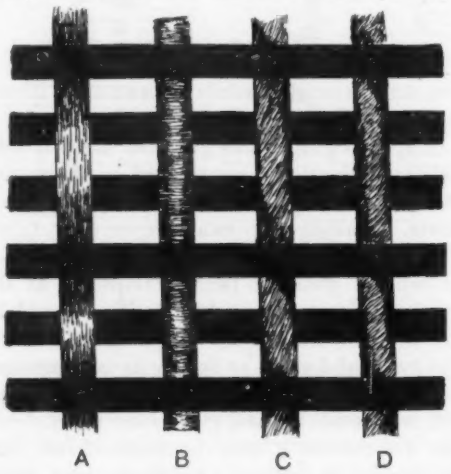


Fig. 22

across. In the thread B (with the maximum amount of twist) the line of reflection runs straight up and down. The reason for this difference is that the fibres in the two threads A and B run in exactly opposite directions.

From these two theoretical examples we may deduce the rule that, given similar conditions as regards curvature of the thread in the cloth, the line of reflection will tend towards A or B according to the amount of twist in the thread. Within the practical limits of twist, say in cotton yarns, the most important effects of variations in twist will be in altering the width of line of reflection. With hard twisted yarns the line of reflection is narrow and tends toward the vertical, as in

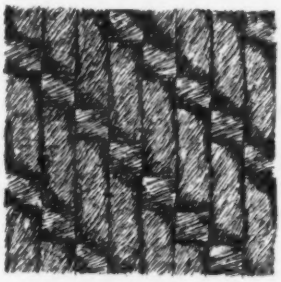


Fig 23.

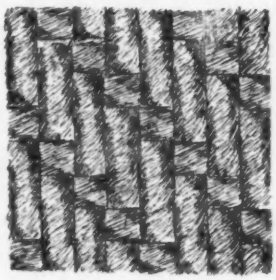


Fig. 24.

thread D, while with soft twisted yarns the line of reflection is wider and tends more toward the horizontal as in thread C. It must be remembered that the chief factor in determining the angle taken by the line of reflection will, with ordinary yarns, be the curvature of the thread or length of the float; so that within the practical limits of twist in cotton yarns the effect of more or less twist will be almost entirely on the width of the line of reflection and very little on the angle.

Figs. 23 and 24 represent two 3 by 1 twill weaves, woven with hard and soft twisted yarns respectively, and it is evident from these that under ordinary conditions the soft-twisted yarn will give the boldest twill. When two-fold yarns are employed the line of re-

flection is considerably modified, and is, in fact, much more complex, owing to the number of different items which influence the curvature of the fibres. The original twist in the single yarn, the doubling twist and finally the curvature of the thread in the cloth, all influence to some extent the curvature of the fibres, and consequently they affect the line of reflection. The exact character of the reflection from a two-fold yarn depends to some extent on the amount of twist inserted in the spinning and doubling. In Fig. 25, A illustrates a two-fold yarn in a straight position. B shows an example curved, as in cloth. On examining the thread, A, it will be seen that short lines of reflection are formed on each strand, the exact character and direction of which depend on the relative amount of twist inserted in the spinning and doubling. These individual lines of reflection form, in the aggregate, a broken and somewhat subdued line running down the middle of the thread. In the curved thread B the main line of reflection is deflected so as to run diagonally across the thread in the direction opposed to the doubling twist, while the short lines on the strands still run in the same direction as before. This being the case there are two series of lines of reflections which may influence the twill: First the main line which in the example given would assist a twill running to the right; and second, the short lines on the strands, which would assist a twill to the left. As a rule it may be taken that the main line will exert the greatest influence, and consequently ordinary two-fold yarns which are doubled weft way should be treated as weft way yarns. The influence of twist with two-fold yarns cannot as a rule be very great, and the difference to be noticed between two twills running to the right and left respectively is comparatively small.

The manner in which the yarn is treated in the preparatory processes, especially in sizing, will also exert a considerable influence on the character of the lines of reflection and consequently on the appearance of the cloth. A heavily sized twill cloth does not as a rule show up the twill as boldly as a lightly sized one woven from similar yarns. This may be largely traced to the manner in which the addition of large quantities of size affect the fibrous structure of the thread. The more extraneous matter there is added to the yarn the more the interstices between the fibres are filled up. It is quite possible, by adding large quantities of size, to destroy or hide the fibrous structure of the surface of the thread and convert it into a smooth, round cylinder, in which case the diagonal tendency of the line of reflection will be lost. Then again the addition of large quantities of size tends to obscure the bright reflecting surface of the fibres, the effect of which in the cloth is to diminish the brightness of the line of reflec-

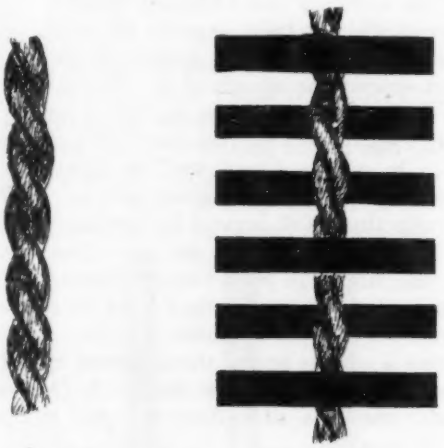


Fig. 25.

tion, and to tend towards a more even illumination of the whole surface.

In applying the rules given in these articles each case should be considered on its merits, and the treatment made to suit the requirements. Taking for example a drill fabric woven with a 2 and 1 twill weave, in which the boldest possible twill is required as the first consideration; such a fabric should be woven from twist way warp, spun with as little twist and sized as lightly as is consistent with good weaving. The weft should be spun twist way, and the twill run to the right.

In conclusion it may be pointed out that this subject is not only an interesting theoretical problem, but is of considerable practical importance, and is well worth attention from all concerned in the manufacture of textiles. What we see of any fabric is simply the light reflected from it, and anything that affects the reflection of light as much as the twist has been shown to do must of necessity be of considerable importance to the appearance of the fabric.

A NOVEL LAPPET FABRIC.

BY JOSEPH HARGREAVES.

This is a fabric which was prematurely placed upon the market several years ago. The restrictions which are put upon certain cloths prevent their full development. This particular fabric was classified by the French customs authorities as embroidery cloth, on account of the thick ornamentation being stitched upon the face of the fabric. On April 10, 1894, I took out the English patent for this particular make of cloth. Within recent

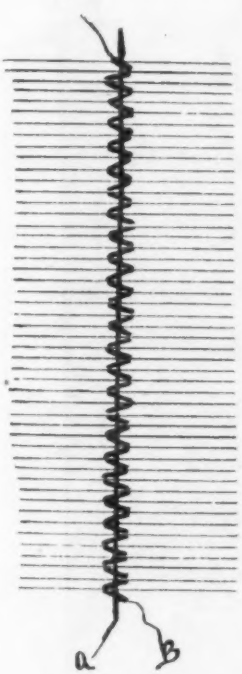


Fig. 1.

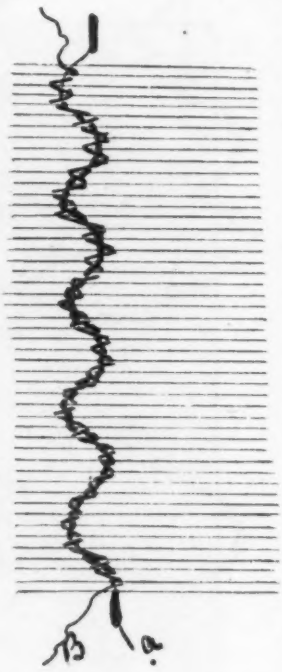


Fig. 2.

years the manufacture of this fabric has been undertaken in the United States. The patterns which have come under my notice are good and appear to be of a salable character.

This kind of cloth is capable of great development. The feature of this fabric consists in stitching corded threads, or what might properly be called wadding warp ends, upon the face of the cloth by suitable stitching or figuring warp ends. The wadding warp ends can be either stitched into the body of the fabric at intervals or not stitched in, according to the design required to be produced. The stitching warp threads besides being used to fasten the wadding threads upon the face of the cloth may be employed to make spots or any other effects which may be required. In the manufacture of this cloth frames are used carrying needles and actuated by cams or wheels or any other means which may be practical, such as are usual in lappet weaving. The stitching warp ends are passed through the needles of a frame called the needle bar, and the wadding warp ends are passed through the needles of another frame or needle bar. The stitching ends are so actuated that they will be stitched into the cloth and held into posiiton by the filling or weft on both sides of the respective cord or wadding end. This fastens the wadding end upon the fabric and forms raised lines of a design regulated by the lappet wheel, or any other equivalent. By causing the two frames to take a similar direction and not stitching the wadding ends into the cloth by the filling, a raised line or cord, curved or zigzagged as desired, can be produced. By zigzagging the wadding ends and stitching them at intervals into the fabric other and varied effects can be produced.

The stitching ends may form a complete cover for the wadding ends, or may only stitch over the wadding ends at intervals. The stitching of the wadding warp ends upon the fabric by the stitching warp ends may also be effected in several ways. The wadding warp ends may be moved from side to side as the stitching ends rise and fall, with or without a slight sideways motion to be stitched or woven in by the filling or weft, or the wadding ends may be held steadily and the stitching ends have a to and fro motion as well as the rising and falling motion imparted to them. By this motion they will be carried first to one side and then to the other side of the wadding ends and by their upward motion, if needles are underneath, and downward motion if needles are on the top side of the loom, will be stitched into the cloth and held into position by the filling or weft.

It will be evident that this kind of weave

is applicable to various kinds of figured or other woven fabrics as well as to plain fabrics, and that a variety of effects can be obtained by using different colors in the wadding and stitching warp ends and ground fabric.

Fig. 1 illustrates an effect made with the stitching ends only being held by the filling or weft, the wadding ends simply being covered by the stitching warp ends. If after weaving the wadding thread is withdrawn from a piece of the cloth, it will be found that the stitching warp thread has simply formed a tube in which to hold a thick thread and thus form a substantial cord effect upon the fabric. A shows the wadding end, B is the stitching end. In making a straight cord the needle holding the stitching end does not move in a lateral direction, but in its upward or downward motion strikes into the ground warp threads at the same place every pick. The wadding warp ends are given a lateral motion only, moving to the right of the stitching threads for one pick, then to the left of the stitching threads on the next, and so on throughout. This moving to the right and to the left by the wadding ends is solely for the purpose of allowing the stitching threads to pass it and thereby envelop it within its stitches. A straight cord can be made by the ordinary method of leno weaving, but it is not so pronounced and round.

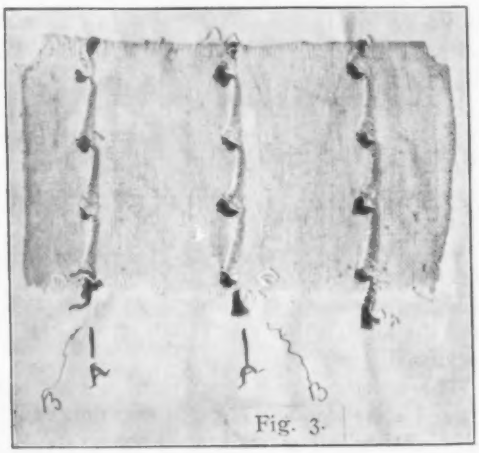


Fig. 3.

Fig 2 illustrates a raised cord similar to Fig. 1, but forming a zigzag line. This cannot be done by the ordinary leno method. A represents the wadding end, B the stitching warp thread.

Fig 3 illustrates a pattern in which the wadding warp threads are stitched into the cloth at intervals, while the stitching warp ends are stitched into the cloth every pick. The wadding warp ends are red (bleaching color); the stitching warp ends gray. The effect of this weave is that of a short graduated tuck, with the base showing a red line or spot, the graduated tuck from the base to the apex being white. A represents wadding warp ends red. B stitching warp ends.

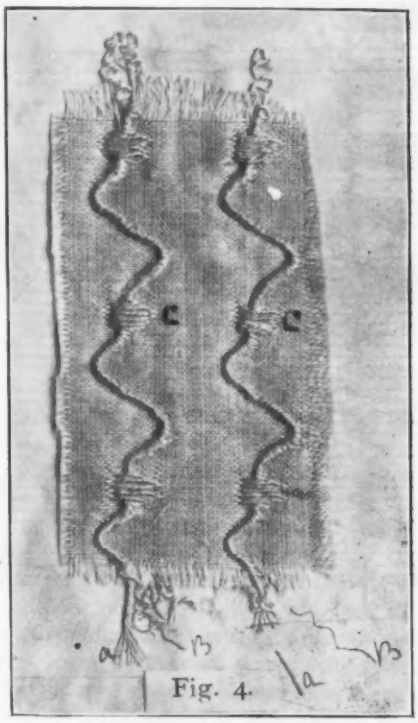


Fig. 4.

Fig. 4 illustrates a pattern in which the stitching ends besides covering the wadding warp ends, also receives a lateral motion, thereby producing spots or any other effect desired, as shown at C. While the spot is being made the needles holding the wadding ends do not move, they remain stationary, with the exception of the movement with the sley.

Fig. 5 illustrates a design, the study of which explains fully the methods of weaving which have been explained in this article. A represents the stitching threads making a trailed effect when not required to stitch in the cord. B represents the cord or wadding end making a pearl cord effect by being fastened into the ground fabric at intervals. C is an effect made by the combination of both threads working, as previously explained, thus making a very pronounced cord in the form of a curved line. The whole design is

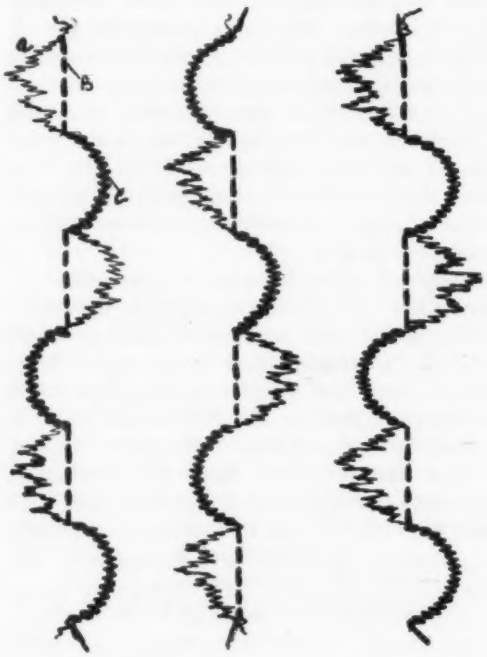


Fig. 5.

composed of the above three effects variously arranged upon a plain ground fabric.

THE OPERATIVE VALUE OF SPINDLES.

The author of the interesting article of the above title which appeared in our March issue is H. D. Martin, a well-known cotton mill superintendent and a member of the New England Cotton Manufacturers' Association. Mr. Martin is at present manager of I. E. Palmer's Centre street cotton mill at Middletown, Conn.

ENGLISH NOTES.

(By our Special Correspondent.)

The reduction in the prices of coarse wool or of rags has made merchants hungry for an equivalent decrease in the price of pieces. Arguments are brought to bear as to the liklihood of a further decline due to the massing of new clip supplies on this side. The coming of wool bought in the Colonies at lower rates has demonstrably weakened the market, and thus far there is no such frantic demand for wool goods for consumption as has been felt in Lancashire for cottons. Eighty per cent. of the cotton mills have lucrative engagements for all the time between now and autumn. It is to be noted that some of our greater iron industries are improving in a way indicative of an improved home demand for woolen cloths of cheap and medium quality.

The lowering of the qualities of tops has been a fertile source of discussion. According to Mr. Alfred Ayrton, the Bradford topmakers are not wholly to blame. He believes it quite possible for standards to depreciate against the topmakers' will and knowledge, and in particular when wool supplies are severely contracted. His fellow topmakers, he considers honest in the main, though he cannot approve the general practice of selling a blended top as unblended. The practice of Continental wool buyers is to adhere as firmly as possible to one brand of wool and he commends the tendency of Bradford men to follow that example. Now that prejudice has worn down a little there is more selling of Montevideo and Buenos Ayres tops under their true names and business exigencies serve to prevent a too wide disingenuousness in these matters.

There has been a flood of good advice since the question of foreign matter in tops was first broached publicly. Cases have been brought home proving vegetable fibres to have been accumulated upon tops after leaving the comber's or dyer's care. Urgent advice has therefore been given to wrap all bobbins or balls in two thicknesses of paper and to avoid all bad or hairy canvas. Again the excellent advice has been given to test the tops by dyeing samples before proceed-

ing to spin and incur expense in burling.

The suggestion is made that the practice euphemistically described as "averaging" may have some responsibility, which is to say that inferior material blended with good is the means of introducing undesirable matters. Plausibility is lent to this view by the fact that since tops became permanently below the parity of raw wool the nuisance has become more marked. Nobody denies that wool sorting is a much more hasty and heedless process than it was ten or twenty years ago.

Americans will not think over-generous the bonus proposed by the Administration to stimulate the woolen industry in the Orange River Colony. A London and Natal merchant house is considering whether to lay out $250,000 on a blanket mill at Harrismith. There will be no protective tariff, but instead a bounty of 12 1/2 cents per blanket and 6 cents per yard on cloth will be paid for three years if 20,000 blankets per annum are woven. Thenceforth it is possible that a tariff may come into being.

Enquiry fails to disclose any British firm of worsted spinners with a full plant of "French system" frames. A few firms have some cone-drawing machinery along with the regular open drawing for long wools. Nobody has ventured to put all his eggs into the French-system basket. The opinion has been hazarded that the enterprise would pay, but our spinners cannot bring themselves to the point of abandoning all opportunity of working long wool.

Gabardine cloth is the name given to a fabric now being rainproofed in large quantities. This material is for cloaks for men's or women's wear in shades of brown and tan. It is of two-fold Egyptian cotton yarn in both directions in very high counts. The weave is a twill of the cashmere or paramatta type, closely compacted and counting up to 140 picks per inch and the finish is pure. A future is before this stuff unless appearances are unwontedly misleading.

Another popular cloth for rainproofing is a herring-bone design for ladies' dust or motor cloaks or costumes. The mill price is about 50 cents in 60-inch width. In the warp two ends of plain two-fold worsted alternate with two ends of worsted and cotton grandrelle, and the effect of the cotton in piece-dyeing is to give a mixed appearance. The filling is of pure worsted yarn. This make promises to fill a gap left by the diminished demand for the covert goods. Gray and brown are the tones asked for in this style.

For a time business in the rainproof cloths has not been brilliant, and it would seem that the rubber proofed article is to live on. An exceptionally wet season revives the demand for the old-fashioned layer of rubber and motoring supplies a new use for it. Withal, the wax-proofed garment has its advantages and more raincoats than mackintoshes are sold. Some disfavor has been earned for the latter by the fraudulent practice of selling as rainproof cloth that has been through no proofing preparation and further by use of inefficient processes which belie their name.

Many reflections have been made on the decay of the fine woolen industry in the West of England. The number of mills at work is probably no more than a quarter of those which existed less than thirty years ago. But certain mills survive and even flourish and it is necessary to ask why. The prime reason is that the survivors have accommodated themselves to the use of worsted yarn, and have kept their plant in the same condition of efficiency as their newer rivals in the North. The deceased are those who clung to a dying demand until the demand was dead. Long since, the home population abandoned the old teazled and boiled "broadcloth" for its Sunday best, and now that great stand-by of an earlier day is never seen or heard of. Suiting trade having gone, there remained only the overcoating business, which has been divided into too many branches to give all the makers of plain fine woolens a livelihood. Hostile tariff aggravated a situation that must in any case have become acute a little later. It is the non-adaptive who have perished and those who live in our West are living by the same stratagems as their successful colleagues all over the world. They are making what is wanted on machinery of the most modern

type. Those who have gone were country gentlemen first and manufacturers after.

But if worsted has killed woolen in one quarter, woolen is ousting worsted in another. Temporarily, at least, the cheap trade in worsteds is suffering severely from the competition of its rival. In a time of dear wool, and with the wind of fashion favorable, the occurrence is easily explained. Woolen can almost always be cheapened whereas worsteds cannot. Fancy woolens, whose appearance belies their constitution, are sapping the vitals of the low worsted trade. The condition may not last, but we find in Britain that every branch of the trade has its bad times and perhaps the happiest are those who can straddle across woolen and worsted using either or both as the case demands.

In the West one finds the survivors equally able and willing to make tweeds, coverts, serges, superfine plain cloth, khaki for army wear or blue for the navy, at medium prices. A more miscellaneous list might be compiled of goods actually made in one mill. By splitting energies into so many fractions one is seldom so cheap as the cheapest. Yet the West of Englanders make money in the face of manifold difficulties. Their example is not for everyone to copy. As a matter of fact more money is made by pursuing another policy in other places, but in their own peculiar circumstances our Westerns are doing what is best for themselves.

A NEW WARP LET-OFF MOTION.

The let-off motion shown in the accompanying illustrations differs from all others by reason of its not requiring any connection either with the loom frame or the floor. This eliminates certain difficulties which are met in rope and double face let-offs. The warp is kept under a uniform tension and as a result the fabric is made more uniform. It often happens that with the rope let-off the weights and counter weights are carelessly adjusted so that one or the other touches the floor causing an irregularity of the goods.

When the shed is formed the beam is moved for a short distance in order to deliver the necessary length of rope. This is again taken up when the shed is closed so as to bring the rope under tension when the lay beats the filling into the cloth. These results are accomplished rather indifferently with the rope and double face friction let-offs but it is claimed that they are accomplished perfectly with the new device.

The new let-off consists of a shoe, l, to which is attached a steel band, the interior of the latter being covered with leather. This is held by a band at the end of the screw, b, which is adjusted by the nut, K. This nut is connected with the knee, H, which swings on the pin, a, in the shoe, l. By means of the levers, p and e, the parts, H and l, are connected with the hook, r, to which a rod carrying the weights is attached. When the shed is closed the device is in the position shown at Fig. 1, all the weight, P, operating on the warp. When the shed opens the extension of the warp causes the brake to oscillate as a result of which the parts, f, approach a vertical position. This causes a portion of the weight of P, to bear upon the shoe, l, by causing the brake to slip slightly backwards. In this way the tension of the brake is slightly less when the shed is open than when it is closed. This is the reverse of the action of the ordinary let-off and is an important advantage in weaving. This slipping backwards is effected at each passage of the shuttle, the position of the let-off being shown at Fig. 1. Fig. 2 shows the let-off motion as applied to the loom. Among the other advantages of this motion are the following:

1. Ease of application to any kind of loom without connection with the loom itself.
2. The let-off is very sensitive.
3. Economy of weights amounting from 50 to 75 per cent. as compared with the devices ordinarily employed in silk weaving.
4. Ease of operation. The operation of lifting the weights is facilitated by the handle on the casting, S.
5. The brake is not in the operator's way even when three or four beams are used together.
6. Fewer broken threads and a more uniform fabric. This regularity is especially marked in goods made with two or three different kinds of filling.
7. The let-off is not affected by the tem-

perature as is a rope friction, to which it is necessary to apply chalk from time to time.

8. By attaching a ring to the casting, S, the weaver is prevented from changing the tension on the warp.

9. The device being simple and strongly built the wear of the leather and other parts is reduced to a minimum.

Before attaching the device to the loom it is important that the disk should be well cleaned. This disk should be at least one-quarter of an inch larger than the strip of leather. If the length of the leather band does not correspond with the circumference of the disk the band can be adjusted approximately to the disk, i, by means of screws. The exact adjustment is obtained by means of the screw, b. When the take-up in is place the two levers, p and e, form such an angle that the band, f, is about one inch from the straight line, g, h. If the friction is too tight it will not slip but be dragged by the beam. In the opposite case the point, f, is too far away from the line, g, h. This will reduce the friction and cause the device to slip too easily. The screw, a, is set by a half turn, holding the end of the screw, b, in the hook, c, and preventing the let-off from opening when the warp is delivered.

The position of the nut, K, in one of the three holes, 1, 2, 3, in the lever, H, determines the amount of friction. If the weight, P, is very heavy it is necessary to use the hole, l, to prevent the let-off from slipping backwards too far. This is in order that the point, f, shall not move too far from the horizontal line, m, n, this being the most advantageous position. It is a good plan to clean the leather frequently removing all dust that may accumulate. This let-off is well adapted for all kinds of loom, but particularly for silk looms. It is built in different sizes by Schelling and Staubli, Horgen near Zurich, Switzerland.—Translated from l'Industrie Textile by the Textile World Record.

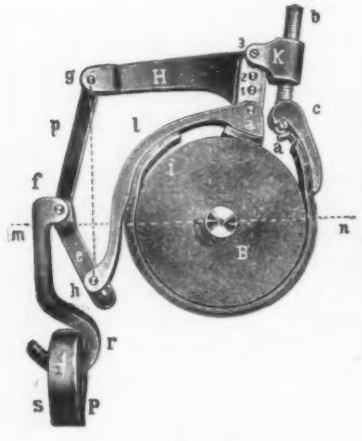


FIG. 1.

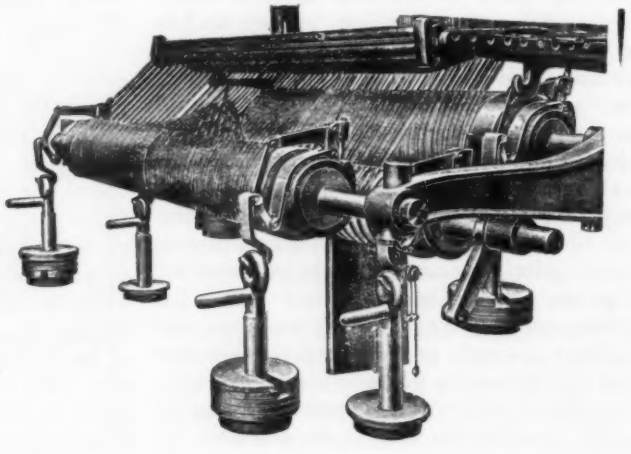


FIG. 2.

Adulteration of Silk.

Silk goods have been adulterated in Switzerland by weighting to such an extent as to bring general discredit on the product of a very important Swiss industry. The evil has attracted the attention of the Government, and M. Pinchetti, Professor of Weaving at the Royal Industrial Institute of Como, has submitted to the Minister of Commerce a plan for a bureau of textile analysis, by which the degree of adulteration can be determined and the trade educated in methods of analysis. The Minister has approved of the project, and its development will be watched with interest as the evil at which it is aimed exists wherever silk goods are manufactured.

Sea Island cotton was first planted in the United States in 1789.

MACHINE FOR MAKING RIBBON CONVEX.

When using ribbon for trimming purposes it is often necessary to gather one side when forming the pattern. This is frequently done by a draw string, but recently a German machine, shown in the accompanying illustration, has been built for finishing ribbon with a convex edge, as when drawn up with a string. The ribbon is drawn over one or more cone cylinders heated to set the fabric. The process is simple and inexpensive and requires but little preparatory treatment of the fabric. The ribbon is woven as usual in any required number of widths, then finished and cut apart at the reed openings.

Fig. 1 shows a side sectional view of the new machine for shaping the ribbon. Fig. 2 is an end section. The ribbon is drawn under tension over the bars, a, which are covered with plush and set in the frame at regular intervals in such a way that the face of the ribbon is not injured by the high tension. The ribbon then passes over the receptacle, b, where it comes in contact with a piece of felt saturated with the liquor in the box. It then passes over the plush rollers, c, d and e, to the cone shaped roll, f, which is heated by gas. The ribbon is then carried by the cone roller, g, to the cone roller, h. The rollers, f and h, are driven at the same surface speed and consequently the roll, h, takes up the ribbon as the roller, f,

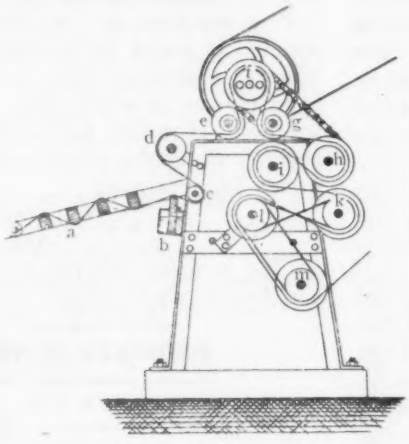


FIG. 1.

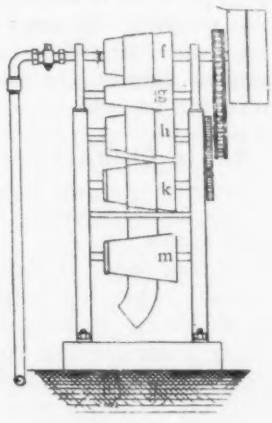
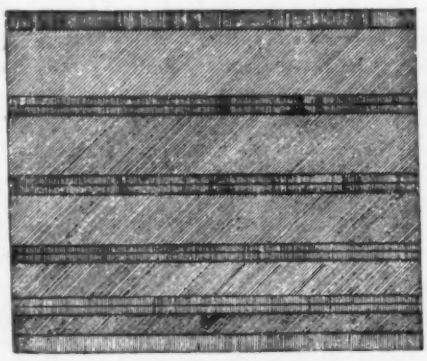
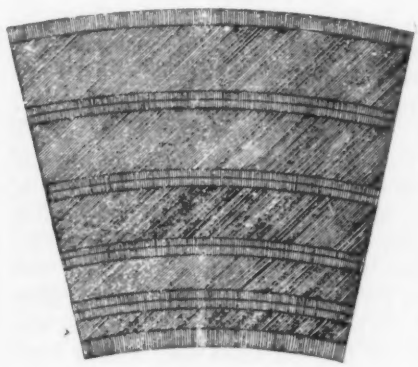


FIG. 2.



BEFORE TREATMENT.



AFTER TREATMENT.

delivers it. The ribbon now passes over the loose plush covered rollers, i and k, the latter being connected by gears to the roll, h. The roll, k, is connected with a cross belt to the plush covered cone roller, l, which in turn is connected with a straight belt to the lower roller, m. Fig. 3 shows the ribbon before treatment, and Fig. 4 shows it after having been shaped by the machine. By using cone rollers of different shapes the ribbon can be shaped in any manner desired. In place of one hot roll, several can be used.

THE RAFIA FIBRE.

Tamatave, Madagascar, Jan. 17, 1905.

Editor Textile World Record:

I am in receipt of your letter of Nov. 22d last asking for details connected with the work required for shredding the fibre of the rafia palm. In reply I am sending you by parcel post a dozen of the leaves, but owing to the postal difficulties can only send young ones some fifteen inches long. Their full length, from which the rafia of commerce is procured, can be judged by the skein of fibre also enclosed and which you will see is as much as five feet. One pound of the rafia fibre contains as many as 200 leaves, and the stalk, as thick as a man's arm, is used in building native huts and as shafts for the filanjana or sedan chair. Each leaf also, as you observe, has a pliable stalk and of the thickness of the ribs of an umbrella. These are utilized for making baskets for fishing in the rivers.

Now as to the mode of shredding the fibre by hand. On examining the pointed end of the leaf you will see that it is double and can be opened out flat. On the inner side will be seen the two strips of fibre, of a greenish color when stripped, but yellow when dried in the sun. In what condition the leaves will reach you I cannot judge. To shred the fibre you fold the pointed end of the leaf over the forefinger of the left hand and with a very sharp penknife cut through the fibre in order to get an end. Some, by merely breaking the leaf when green, near the end, detach the fibre at the broken part and by inserting something underneath set free the pointed end. In whichever way you succeed in catching hold of the pointed end it only remains to peel it off down the whole length of the leaf without any fear of it breaking. I have shredded two in the sample to show the three constituent parts, the fibre, the stalk and the refuse vegetable matter. The fibre needs no further treatment except driyng in the sun.

If a machine or any contrivance were adopted it would be for the most part stationary, although liable to be transported from time to time from one palm district to another. It would be erected in a central position where the natives could bring in the fronds for treatment.

William H. Hunt,
American Consul.

[The samples referred to can be seen at our Boston office.—Ed.]

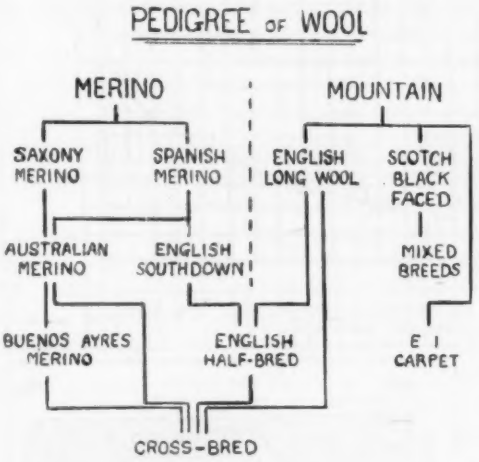
PEDIGREE IN WOOL.

BY S. B. H.

During the last few years the word "pedigree" has assumed much importance in the pastoral and agricultural world, and somehow or other the word, while possessing many intrinsic qualities closely allied to the question of pounds, shillings and pence is, I am afraid, somewhat abused and made to cover up a lot of sins and faults both on the part of the breeder and the animal. Pedigree in wool is a quality that cannot be "faked."

In considering the subject of wool, there is no item which forces itself home so quickly as the large number of different qualities which are met in any public sale. Even at a country sale of farmers' clips in England one sees "pitched" a very large number of qualities which even to the uninitiated can be easily picked out and which carry home the conviction that these are but a sample of what are met in larger sales, say in London or Australia. Wool dealers are not responsible for so many different grades. The responsibility rests entirely with the sheep breeders of this and other countries. Wool men, to my knowledge, have never called for half the qualities that are today on the market, but it speaks volumes for the enterprise of manufacturers when they have readily taken without even so much as a growl all the qualities

which have come to hand, rising to the occasion by producing fabrics sightly to the eye and reasonable in price. I dare say manufacturers would have been satisfied to have had placed at their service a good carpet wool like Scotch blackface lustre wool by the Lincoln; hosiery wools by the Shropshire and Southdown, crossbred of say 40's quality and fine 60's from the merino, but today a man can be supplied to his heart's content with any grade of wool from a 24's quality up to a 70's, while even wool spinnig up to 100's quality is available. In this fact we have an illustration of the expanding energy of the sheep industry of the world. The ability to buy 40's, 60's, or 80's wool shows what men can do with nature when he sets to work with brains and a will. In the great variety of



qualities, breeds and standards of wool the sheep and wool trade of the world has conferred a boon upon humanity at large, and the thanks of all are due to the practical sheep farmer for his unremitting energy and skill in breeding sheep and growing wool well suited to the numerous needs of the world.

A glance at the accompanying wool genealogical table shows from what stock the various qualities of wool have sprung, the merino breed of sheep claiming the first position as being the most important breed and the most fruitful source in producing the numerous qualities which abound today. The merino is the alpha and omega in the colonial wool trade, and it will be a dark day indeed for Australasia, South Africa, South America and the United States when the merino ceases to be numbered among its sheep stock. This Saxony breed of sheep has done more in shaping the wool trade of the world than has even the British Lincoln or Leicester, for had there been wanting the fine framed merino the mutton sire would have had to take a back seat, especially in the great crossbred wool trade of the world. Merino wool ranks today as the highest priced wool on the market, its manufacturing qualities are well known and undisputed, its possibilities and capabilities remain unchallenged as much as ever, and with men and women's tastes being the wide world over for wool fabrics looking "smart and dressy," the future well-being of the merino is fully assured.

It is well known both to sheep and wool men that there are several family types of merino sheep in the world, but that distinction receives far more consideration among sheep breeders than among wool buyers and users. For instance, we have the Saxony merino and the Spanish merino, both of the Negretti and Rambouillet type. It may interest readers to know that there are still in existence in Norfolk, England, a few of the Negretti merino sheep which are the direct descendants of the famous stock imported into this country by His Majesty, King George III. in 1791. There are also several other families of merinos, chief of which is the pure Australian, Tasmanian and the famous Vermont merino of the United States, all of which produce fine Botany wool which is much appreciated by our manufacturers. On every hand we can see merino wool being called for in quantities which are highly satisfactory both from a grower's and manufacturer's standpoint. Today on account of its relative scarceness it is somewhat dear and is suffering in consumption on that account. Our table shows that more breeds of sheep have arisen from the merino than from any other class of sheep, and it is hardly yet safe to say that finality has been reached in the line of direct breeding from this famous sheep.

After many failures the power loom was successfully introduced into England in 1805.

MOISTURE IN COTTON.

In the course of a recent lecture J. H. Lester, who is in charge of the Manchester, Eng., Testing House, referred to Schloesing's tests of the hygroscopic properties of textile fibres.

This authority has tabulated his figures in graphic form. Fig. 1 shows the percentage of moisture found in cotton, silk, or wool, under any possible atmospheric conditions. We may assume the percentage saturation of the air as 70 (or 0.70 as Schloesing gives it). The diagram shows that under such conditions 8 per cent. of moisture will be contained in cotton thoroughly exposed to such an atmosphere. It will be noticed that the central line for American cotton cuts the line marked 0.70 at a point immediately above the horizontal scale, showing 8 of "moisture per 100 of dry substance."

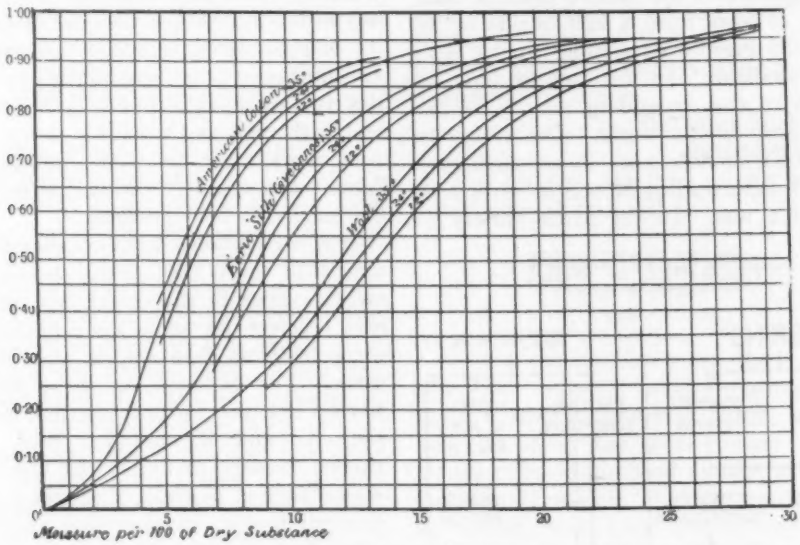


FIG. 1. SHOWING THE AMOUNT OF MOISTURE CONTAINED IN COTTON, SILK, AND WOOL, UNDER VARYING ALMOSPHERIC CONDITIONS.

Again, in the case of silk, if the saturation of the air is equivalent to 60 per cent., we find that silk exposed to this atmosphere will contain 10 of moisture per 100 of dry substance. Mr. Lester explained the bearing of Schloesing's tables upon the various standards of moisture for different fibres, showing that these standards had a true scientific basis, and that the standard fixed for cotton was, if anything, slightly in favor of the seller. It is necessary to distinguish carefully between "percentage of moisture" and "moisture per 100 of dry substance."

Fig. 2 illustrates the fact that after cotton has once been dried to the point of absolute dryness, it will take a considerable time before it will absorb from the air its full complement of moisture—if indeed it will ever do so. The rise and fall of the upper line marked "Untreated Yarn," is due to natural variation in the moisture of the air from day to day; and we see that "Yarn after being

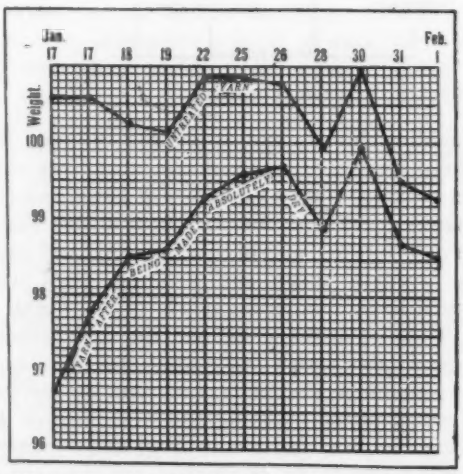


FIG. 2. SHOWING COMPARISON OF DRIED AND UNDRIED COTTON, AS REGARDS MOISTURE-ABSORBING PROPERTY.

made absolutely dry" (as shown in the lower curve) will take at least a fortnight before it is in suitable moisture-absorbing condition to retain as much moisture as the undried or untreated yarn. It may be explained that the weights of dried and undried yarn were the same before one of them was dried.

Fig. 3 is a graphic illustration of the process of testing yarn which was carried out while Mr. Lester's paper was being read. It may be explained as follows: At 6.15 P. M. 200 grains of cotton was placed in the drying

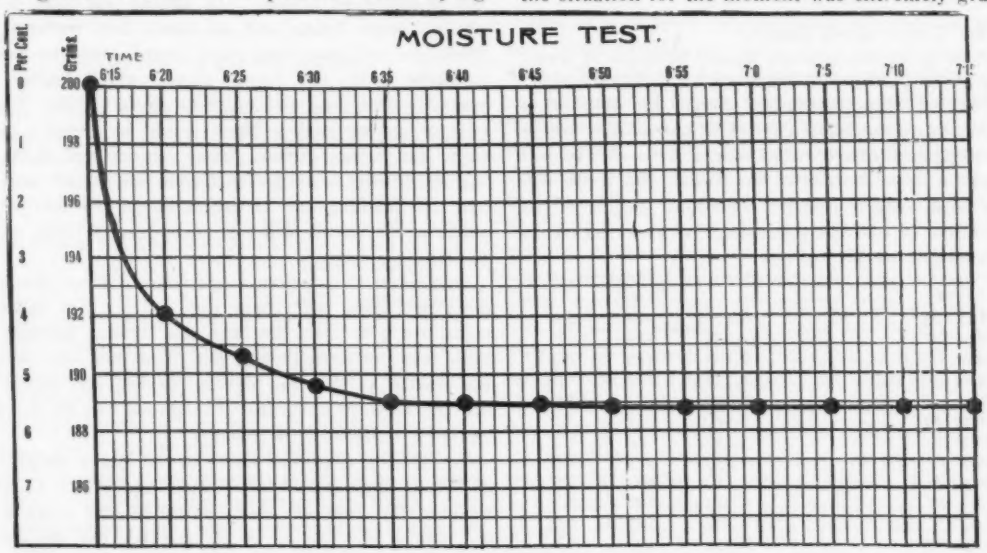


FIG. 3. ILLUSTRATING THE GRADUALLY DECREASING LOSS OF WEIGHT CONSEQUENT UPON THE DRYING OF COTTON IN AN EFFICIENT DRYING OVEN.

oven, and (without removal therefrom) weighings were taken every five minutes. At 6.20 the weight had fallen to 192 grains, owing to the loss of moisture, each weighing being indicated by the succeeding black spots. At 6.35 the drying was practically complete, though a slight further loss of weight occurred at 6.50. Further drying caused no further loss of weight or moisture. The object of the test was to show the rapidity of drying which is possible with the oven recently designed by the lecturer.

Cotton ginning in Egypt is usually done in the interior towns. The gins are mostly owned by the cotton merchants and the large exporting houses.

THE LABOR QUESTION IN RUSSIA.

A dispatch last month from Lodz, the great textile centre in Russian Poland told of some curious features of industrial conditions as follows:

Coats' Thread Mills and many other establishments today paid to the strikers three days' wages as an advance, although nothing was legally due to them. Heintzel's Mills refused to pay anything, and thereupon the workmen became greatly excited, and threatened to wreck the premises. Military guards were preparing to fire on the men, and the situation for the moment was extremely grave. Danger was only averted by the management yielding and agreeing to pay as other mills had done, provided the men promised to return to work on Monday. Another manufacturer named Steigert also refused payment, but later he was compelled at the point of the revolver to promise to pay tomorrow. In no case was any money legally due to the strikers, and it is believed that the employers are paying from motives of expediency in the hope of inducing the men to return to work. The representatives of the manufacturers have sat in conference the whole day, and have had frequent interviews with the Governor of the town. Definite action on their part is expected tomorrow. The Steigert incident has created a bad impression, and the employers are urging the authorities to adopt strong repressive measures.

Probably nowhere except in Russia would a demand at the point of a revolver for payment for doing nothing be looked upon as anything but highway robbery.

Questions and Answers.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

For reply to questions that are not of general interest to readers of textile journals, such as those relating to the composition of yarns, analysis of fabrics, etc., we will charge the enquirer with the cost of the investigation.

Filling Waste.

Editor Textile World Record:

How much filling waste should be made in weaving goods with 3 1/2 run filling? York (520).

The following statement shows the amount of filling waste made for a series of consecutive weeks in 1889 in a weave room where 4-run filling was used on three-fourths of the looms and 2-run filling on the other fourth. The total weight of the cloth woven and the percentage of waste based on this weight are also given.

Week ending.	Pounds cloth woven.	Filling waste. Pounds.	%
May 25	6,115	212	3.4
June 1	4,935	125	2.5
June 8	6,123	115	1.9
June 15	7,136	117	1.6
June 22	6,899	133	1.9
June 29	6,586	118	1.7
July 3	3,150	42	1.3
July 13	6,733	125	1.9
July 20	4,116	102	2.5
July 27	5,943	120	2
Aug. 3 and 10	16,989	329	1.9
Aug. 17	8,554	157	1.8
Aug. 24	7,926	148	1.9
Aug. 31	7,849	149	1.9
Sept. 7	6,072	127	2.1
Sept. 14	7,910	165	2.1
Sept. 21	7,666	148	1.9
Sept. 28 and Oct. 5	12,562	254	2
Oct. 12	6,424	116	1.8
Oct. 19	6,404	125	1.95
Oct. 26, Nov. 2 and 9	19,935	374	1.87
Nov. 16	6,903	155	2.24
Nov. 23	6,995	127	1.81
Nov. 30	5,815	152	2.62
Dec. 7	7,520	149	1.98
Dec. 14	5,986	131	2.18
Dec. 21	7,105	148	2.08
Total	206,351	4,163	2.01

This list begins with the first week for which a statement was kept and it is interesting to note the marked reduction of waste from 3.4 per cent. to 1.9 per cent. as a consequence of the efforts of the overseer to prevent an excessive amount of filling waste. This illustrates the value of such statements in keeping the overseer constantly informed regarding the exact amount of waste made in his room.

Black on Cotton Goods.

Editor Textile World Record:

What is the cheapest black dye used and what machinery would be necessary to dye cotton goods where nothing but a plain soft finish is required, like the sample enclosed? Also give a rough estimate of the cost of the machinery required, except the tentering bars, which we have.

Stuyvesant (499).

An article by Roger Williams published in the March, 1903, issue of the Textile World answers this question fairly well, but there are some points which might be added. The sample enclosed is a cheap cotton lining and no small firm without a dyehouse and finishing plant could compete successfully with the large plants which make a specialty of dyeing and finishing these goods. The cost of dyeing such a black would be about 1 1/4 cents for drugs; steam, labor, starch and finishing would cost from 3/4 to 1 cent per pound more, and the finishing can be estimated at 5/8 cent per yard, as the goods will run from 7 to 8 yards per pound.

One plant that makes a specialty of these goods does not even boil them out. They are taken from the grey and run into the dyeing machine, then into the drying cans, and from the cans into the starch, so that the dyeing, drying and starching are done in one run. The goods can be dried again or tentered if necessary.

For modes, grey and slates in the heavy weights of linings they are bleached and dried in the usual manner, but they are dyed, starched and dried in one run at the rate of 80 to 90 yards per minute, so that one or two men can dye and starch thousands of yards per day. These goods, which are intended for shoe linings, corsets, and pocketings, are all put through in this way in any up to date concern.

The method is as follows: The amount of dye needed for the shade is added to the starch and boiled together and when it is ready the goods are dyed, starched and dried at one operation. The starch mangles are of the best make, the tubs for mixing dye and starch are of copper and the drying cans are of copper and can be easily cleaned if necessary.

The equipment required for dyeing a black like that on the sample sent would depend somewhat on the requirements of the customer. The sample appears to have been sheared and singed, with a light starch and a calender finish. If the goods are to be used where they do not show, the shearing and singeing could be dispensed with and they could be entered into the dye in the gray and dyed, dried and sized in one operation. Then they could be sprinkled and calendered, folded and finished.

In this case there would be required one sewing machine, one four-hole dyeing machine, one set of drying cylinders, a starch mangle, a sprinkler and a calender.

In conclusion I would repeat that there cannot be much money saved by a small firm doing its own cotton goods dyeing in competition with concerns who make this business a specialty. Extra capital would need to be invested in the dyeing and finishing plant and Stuyvesant would then have two businesses to look after instead of one, and one of them he would have but a limited knowledge of and would be obliged to hire others to look after it for him. Baumwolle.

The Sizing of Velveteen.

Editor Textile World Record:

We size velveteen which is required to be very stiff like the sample enclosed. At present we use a glue for this sizing, but find it comes too high, about 1/2 cent for every yard of velvet. Can you not suggest a cheaper size that will at the same time stiffen the goods as much as the glue does?

Demetrius (538).

In making up a size for pile fabrics that require considerable stiffness, such as the sample submitted, three raw materials are available, viz., Irish moss, gum arabic and gelatine. Unless a very rich and leathery feel is wanted the two latter only are employed, in which case they can be used together with a small quantity of cocoanut oil or soap.

A very good size for these goods is made with 1 part gum arabic (the brown grades being used for dark backs) and 3 parts refined glue (not white gelatine) and about 6 to 8 per cent. of soap added during the mixing before applying to the goods.

The reduction of cost below the cost per yard given (1/2 cent per yard) will depend upon the temperature at which the size is spread, and in this connection it is quite possible to give a degree of stiffness by using a hotter size and increasing the speed of the beating-in brushes, so that there is better covering before the goods reach the dryer. A size made of clear glue only, applied hot and well covered and dried, will give a degree of stiffness equal to a compound size which is applied cooler and not beaten in with good brushes.

A very good velvet size and one that will cost even less than that on the sample can be made from gum tragacanth, water, a small quantity of soap to retard stiffness and a small quantity of cocoanut oil or paraffine wax to prevent sticking of the goods if the backs are calendered. Gum tragacanth yield sizes that vary with different lots, but a six per cent. solution ought to be heavy enough for all purposes. Even this will have to be thinned to give a finish like the sample and will be, no doubt, much cheaper. Beta-Naphthol.

Strength of Mercerized Yarn.

Editor Textile World Record:

Kindly inform me as to the breaking strength of a combed and gassed Egyptian mercerized yarn, 120 yards, skein 1 1/2 yards, circumference 80 ends. The yarn has 15-16 turns per inch. The yarn measures 2/102 after gassing and mercerizing, and probably was not more than 2/94 before, but loss of weight in process brought it to 2/102.

Bolton (540.)

This is a subject on which there seems to be very little reliable information. One spinner to whom the question was referred writes as follows:

I do not think 8 or 10 per cent. is any too much to allow for the increase of lengths or count in mercerizing. A 2/80s yarn twisted in the opposite direction to the twist in the single yarn will appear to be a 2/88s at the end of the mercerizing process, as the yarn in this process is subjected to an even greater tension than in the twisting operation. Very little is known about the breaking weight of yarns, not mercerized only, but all other ply yarns. The breaking standard of single 80s is 24.6, but very few mills keep it to this. It may break anywhere from 20 to 24.6 pounds. Two threads of 80s should have a breaking strength of 49.2 pounds, but if they are twisted together their strength is increased anywhere from 10 to 20 per cent. according to the number of turns per inch. According to this idea, a 2/80s yarn should break at 54 to 60 pounds. I do not know that this is correct, as I have never put it to the test, but am trying to find some rule that will answer the purpose.

Gamaliel Gaunt.

Horsehair.

Editor Textile World Record:

Please give me the addresses of some firms importing horsehair, both raw and ready for weaving, from South America and Europe.

Haircloth (529).

If any of our readers are interested in this inquiry we will forward their addresses to our correspondent.

Patent Beavers.

Editor Textile World Record:

Kindly inform me through your columns where the word "patent" as applied to beavers originated.

Moscow (533).

Can any of our readers answer this question?

KNITTING DEPARTMENT.

For Knitting Mill Machinery, Equipment and Supplies, see pages 232 to 253. Also Buyers' Index.

THE KNIT GOODS STUATION.

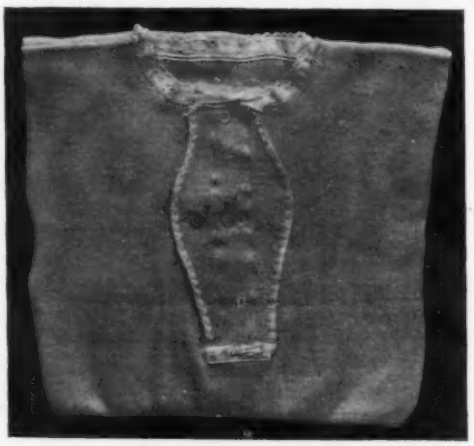
Knit underwear jobbers are very busy at the present time, completing their early spring orders and are duplicating freely with manufacturers, thus taking care of the surplus production of light weights. Deliveries by most manufacturers have been fairly good this season and retailers have received from their jobbers almost their entire purchases in one shipment. About the only exception to this is that of men's low priced balbriggans. These have been somewhat scarce and hard to get delivered promptly.

No stocks of spring weights have accumulated, except some low priced ribbed vests and even of these, the quantity is not large enough to make any impression on the prices. The recent advance in raw cotton has stirred up some feeling of regret on the part of some of those manufacturers who have sold ladies' ribbed goods to weigh about 8 lbs at $1.90. It is claimed that this quotation was based on cotton at about 6c. and that manufacturers were forced into it by competition among themselves, and that now they cannot figure on coming out whole, inasmuch as they are obliged to pay nearly 8c. for raw cotton and on the basis of about 8 1/2c. cotton for yarn.

The situation on men's fleeced goods is nearly as acute as on ladies' ribbed goods. Prices are being held firmly, although there are a number of large manufacturers still open for business. Two of them, who have the bulk of their production practically sold up, have notified their trade that prices will be advanced to a $3.37 1/2 basis for standard lines, but even this does not have the effect of inducing large buyers to add to their initial orders which were smaller than usual. Several manufacturers have attempted to push men's fancy fleeces this season and some very attractive goods have been shown that retail for 50c. Jobbers, however, report so far that their trade has not taken them very freely and if manufacturers do not work on a strictly order basis, we may see an accumulation and a consequent break in prices.

A novelty in men's fleeced goods that has made its appearance is a garment made of mercerized yarn both face and back and is very sightly merchandise to retail at 75c. per garment.

The Troy Knitting Co. are showing an attractive line of men's fancy fleeces and among them is the mock rib effect in fancy mixtures, similar to the fancies made by the old Index Mill at $7.50 several seasons ago. They are making them in $3.75 quality and we understand they have been taken quite well by some of the larger buyers.



AN "ANTI-GAP" VEST.

Another novelty sold by the St. Johnsville Knitting Co., is shown in the accompanying illustration. It is a ladies' ribbed vest called the "anti-gap" vest and patented by James R. Fleeman of St. Johnsville, N. Y. It has a barrel-shaped piece of cloth down the front, one edged sewed down and the other left loose to form an extra lap over the opening at the front.

We learn that the Perry Knitting Co. is showing a boy's fleeced shirt made double

breasted to retail at 25c. per garment. It seems to be scarcely necessary to make a boy's garment in this way, as owing to the double cloth, it must be very bulky. It gives the seller something to talk about and, no doubt, will be taken in liberal quantities.

The Royal Gem Knitting Co. have been offering ladies' combination suits at $2.00 per dozen. These garments weigh about 8 lbs. on size 6 and we are not surprised to learn that enough orders were received by wire for all that they cared to make for the season.

J. C. Roulette & Co. are making a strong bid among the jobbers for the trade on hand finished goods. They now have the organization under an efficient management of 60 people on this class of work and make the point that, owing to the operators being all at work inside the mill, better results are obtained than by sending the work out around the country, as has been the custom with most manufacturers who have been doing this class of work.

HOSIERY.

An encouraging volume of duplicating business on heavy cotton goods has been placed of late and there has also been considerable additional business on wool lines.

Reports from jobbers whose travelers have made their initial trips indicate a satisfactory business and the duplicating mentioned above comes forward to corroborate these reports. Jobbers who have local Eastern trade do not appear as enthusiastic as do those of the West and Northwest, but even they have no serious complaint to make.

Several manufacturers report that they are well conditioned in regard to orders on heavy weights. This has had a tendency to strengthen some lines and to cause buyers to be a little more anxious to place orders than for the past month.

Manufacturers of wool and merino lines are also sold up, but it is noticeable that buyers are operating more freely and extensively on the fleeced end than on wools and cashmeres. It is claimed that they can see more margin in the fleeced goods just at this time, and therefore, are working more strongly on this end.

Most manufacturers of light weights have plenty of orders booked so they are not worrying much about business, but some few are looking for orders and any buyers who are open for merchandise are being well taken care of, although no material concessions in prices are being made. The present small margins in sight for manufacturers with the strong position of the raw materials are causing them to think twice before making any changes in their prices.

It is understood that some manufacturers contemplate giving their representatives samples of spring lines for 1906 early this month and we hasten to advise against any such procedure. Such early opening of lines is only conducive to an unsettling of the market in values and to a long drawn out and expensive selling season, which manufacturers should seek to avoid. Spring lines should not be shown before June and if delayed until July, it would increase the earnings of many manufacturers very materially.

We understand that one prominent selling agent is willing to post a forfeit of $500, binding him not to open his spring line until July 1st, provided a reasonable number of others will go into the arrangement.

CHEMNITZ REPORT.

Hosiery manufacturers are still busy shipping spring goods of which a great many are still due. Mills are running over time in some cases in order to make these shipments.

Orders for plain goods are filled comparatively prompt, but those for lace goods are delayed. Manufacturers are scattering their production among those who have orders placed with them, giving each buyer some goods, but it will take some little time yet to complete the entire orders.

New business is not coming in very fast and especially in the plain staple numbers, buyers are only taking what they must have for immediate use. Unless the market becomes unusually active, a drop in the prices of plain goods is almost sure to happen. The only factor that can count in making a reduction is the yarn, as wages will not go any lower than they are now.

New orders for lace goods have been scarce of late and when those now on the books are filled, a quiet spell will come at the makers of these goods. The production is now much larger than last year and even if

all the other markets in the world continue to buy them liberally, the scarcity of American orders would be felt in the market considerably.

In fine gauge medium and light weight hose, orders have come along freely and the production for several months has been sold. In embroidered goods, the demand is so large that the goods cannot be turned out as fast as wanted. Manufacturers are experiencing trouble in getting the more difficult patterns made up, as there is plenty of work on the plainer styles which the girls can finish quicker at higher wages. For next spring embroidered goods will no doubt be the leading fancy article and already makers are getting up new designs so as to be able to show them to the buyers who are expected in town during the coming month.

In fancy half hose, trade is very good and some delay is being felt in delivery, owing to there having been more goods sold than could be turned out at the time wanted.

Orders for gloves have come in fairly well during the past two weeks and although the business is not heavy by any means, there is now work enough to carry manufacturers through the early season.

Silk lined cashmerettes are still the leading article, while real cashmere gloves are not being taken so well as in former seasons.

Jersey gloves are bought to a certain extent and the bulk of the orders call for two clasp goods. Three quarter lined goods are becoming more popular than the half lined as the lining is stitched on the inside of the palm and does not pull out as easily when the glove is taken off.

Orders for golf gloves have come in quite liberally of late and some fairly good orders have been placed in fancy novelties.

RIBBED KNITTED FLEECE-LINED FABRICS

having a loop-pile surface formed for the purpose of permitting the raising of a superior nap on the goods afterwards.

In this new structure of knit fabrics, the loops which form said pile surface are formed by one of the strands of a compound knitting yarn, this structure being an improvement over the method until now practiced and where the pile surface is obtained from a supplementary yarn engaging with the ribs formed by said main knitting yarn or yarns, a structure which, however, always resulted in a comparatively inelastic fabric.

When in knitting a plain fabric an elongated loop is cast off of a needle of the machine, together with a loop of ordinary length, both loops will be thrown to the back of the fabric; but in knitting a ribbed fabric the simple elongation of the loop of one strand of the compound knitting yarn would result in the casting of said elongated loop between the front and back ribs of the fabric, so that it could not be acted upon by the card clothing of the napping machine in the after process of finishing the goods.

To overcome this disadvantage we find in the new structure one or more of the strands of the compound knitting-yarn projected between the ribs of that face of the fabric selected for the pile surface, so as to form loops extending beyond said ribs, and whereby said loops can be properly napped in the process of finishing the goods, without injury to the body ribs of the fabric. The machine used for producing the new structure is such as has its sinkers so arranged that they can act upon one of the strands of the compound knitting yarn without acting upon the other strand or strands of the same.

In order to explain the new fabric structure the accompanying two illustrations are given, representing on an exaggerated scale, in outlines, pieces of regularly rib knitted fabric, showing, in full black, various ways of interlacing one of the strands of a compound knitting yarn as introduced specially for the formation of pile or fleece to the fabric during finishing (napping) the goods.

Numerals of reference in both illustrations (1 to 11 in Fig. 1 and 1 to 3 in Fig. 2), as will be readily understood, indicate successive courses of loop-formation in the structure, and letters of reference, A and B, the respective ribs—face and back—characteristic to plain ribbed knit goods.

The stitches in the ribs, A, are drawn in one direction, or to one face of the fabric and the stitches in the ribs, B, are drawn in the opposite direction or to the other face of

the fabric, the yarn in the sinker-wales, X, extending from ribs of one face of the fabric to ribs of the other face, the same as is practiced with common plain ribbed knit fabrics.

As mentioned before, a compound knitting yarn, however, is used in connection with the new structure, the minor threads of said compound thread being indicated by letters of reference, a and b, respectively, and of which a (shown in outlines), refers to the regular yarn, as required for the plain ribbed structure, and b (shown in full lines), to the additional strand of the compound thread, either thread (a and b) being controlled by independent yarn-guides or one guide with two feed-holes, so that one strand can be acted upon independently of the other.

With reference to the first course of loop

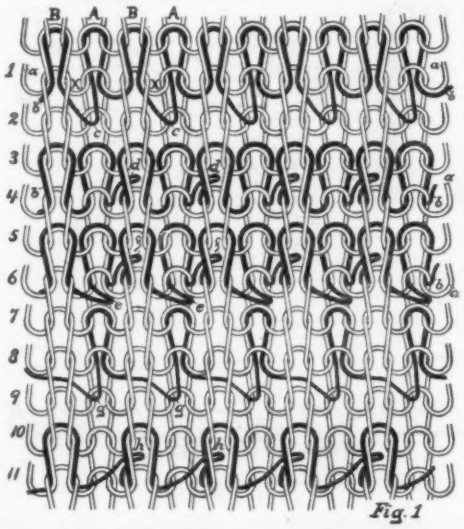


Fig. 1

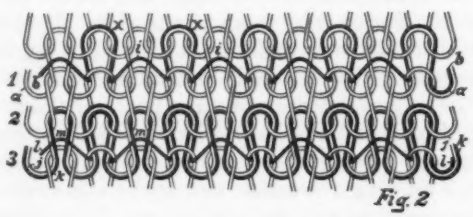


Fig. 2

formation shown in the illustrations (see 1 in Fig. 1), the strand, b, is projected from the compound yarn where the same forms sinker-wales, X, so as to form loops, c, which project outwardly beyond the ribs, B, in order that they can be readily napped during finishing the goods, and without injury to the knitting yarn constituting the said ribs, these loops being formed by applying the strand, b, of the knitting yarn to a projecting sinker in its course from the needle which produces the rib, B, to the needle which produces the rib, A.

In course 4 of the fabric structure shown in Fig. 1 the strand, b, of the knitting yarn is projected so as to form loops, d, on the opposite face of the fabric from that on which the loops, c, are formed, the operation being the same except that the sinkers draw the loop in the opposite direction from those which formed the loops, c.

In course 6 of the fabric structure shown in Fig. 1 the formation of loops on both faces of the fabric is given, viz., e and f respectively.

In course 8, Fig. 1, the loops, g, as formed from the strands, b, of the knitting yarn do not form stitches in the ribs, B, of the fabric, the yarn guides in this case being so arranged that the guide which controls the strand, a, will feed the same to both sets of needles; but the guide which controls the strand, b, will feed the same only to the needles which produce the ribs, A, and to the sinkers, this strand passing behind or out of the other set of needles, which produce the ribs, B, in the fabric.

In course 11, Fig. 1, the strand, b, of the knitting yarn forms loops, h, without forming stitches in the ribs, A, of the fabric. The yarn guide controlling strand, b, in this case feeds said yarn to the needles which form the ribs, B, in the fabric and to the sinkers, but lays said strand, b, behind or out of the path of the needles which form ribs, A, in the fabric.

A compound knitting yarn otherwise disposed, as in courses 8 or 11, as thus explained, may be caused to form loops on both faces of the fabric by subjecting its strand, b, to the action of sinkers disposed in every one of the spaces between the needles instead of only in every other space.

In course 1, Fig. 2, the loops, i, overlap ribs, B, instead of being drawn out between the ribs, A and B.

In course 3, Fig. 2, is shown a similar fabric, in which, however, each compound yarn

is composed of three minor strands, j, k, l, instead of two strands, the strand, l, being the one which forms the loops, m.

With reference to illustrations given it will be readily understood that whatever pattern used (of those seven illustrated) in practice the compound knitting yarn will usually be employed in every course in order to produce a uniform fabric, the single diagrams being given for sake of clearness.

This mode of producing a suitable surface for an improved nap in the finishing of knit goods, and thus shown in connection with a plain ribbed fabric, is also applicable to knitted fabrics in tuck stitch, the location and disposition of the fleecing loops in the latter case not varying materially from those shown in connection with illustrations given.

A STRAIGHT KNITTING MACHINE FOR HOSIERY.

An improved hosiery knitting frame with the needle bar divided into three parts, the middle one adapted to being thrown out of action, has recently been patented in this country. It is claimed that a complete stocking can be knit on the machine without removal, thus reducing the cost of production. Fig. 1 is a front view; Fig. 2, a vertical cross section; Fig. 3, a horizontal cross section; Figs. 4 and 5 show the heel at different stages of the operation.

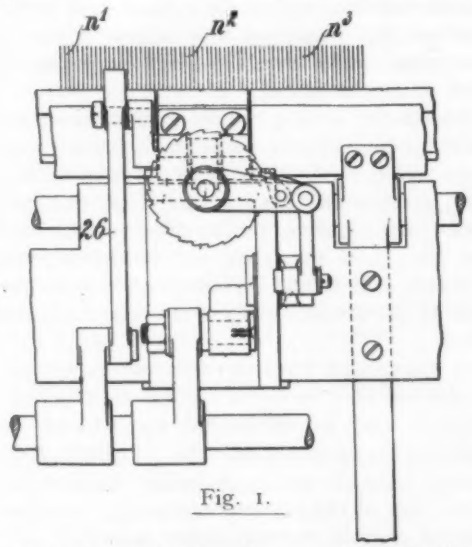


Fig. 1.

The operation is as follows: The stocking, at first is knitted up to the row of loops, a b c d, the hand-lever being at its lowest position. The frame-needles, fastened to the three parts of the needle-bar, up to this moment form a single straight row, because the spring holds the middle part fast at its lowest position, and all the needles work in precisely the same manner as on a common needle frame.

The upper end of the rod, 26, which is provided with a slot on the upward and downward movement of the slide-rest, allows the pin to play up and down in the slot. At the moment the row of loops, a b c d, Fig. 4, is completed the workman attending the machine moves the lever into the position shown at Figs. 1 and 2. The roller rests below the peg, and consequently prevents the slide-rest from moving down also, and at the same time the eccentric presses the half-nut upon the screw-spindle, and the lever end is taken downward by the lever, the spring thereby being extended. In consequence thereof the click moves the ratchet-wheel by a tooth—i. e., the slide, together with the middle part of the frame-needle bar, is pushed forward for

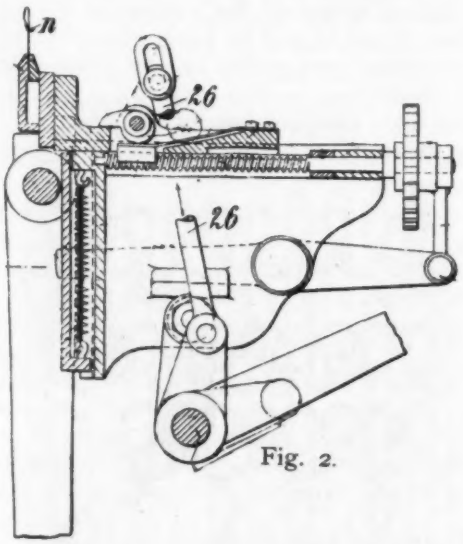


Fig. 2.

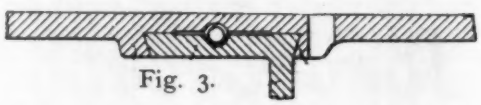


Fig. 3.

one row of loops in the direction of the arrow, x, Fig. 2.

The row of loops, a b and c d, Fig. 4, is accommodated upon those frame-needles, n, which are fastened in the side parts of the needle-bar, and the row of loops, b c, hangs upon the frame-needles, n^2, attached to the disengageable middle part. These latter frame needles do not partake of the looping any more.

The row of loops, b c, moves back each time

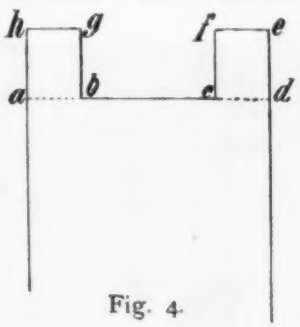


Fig. 4.

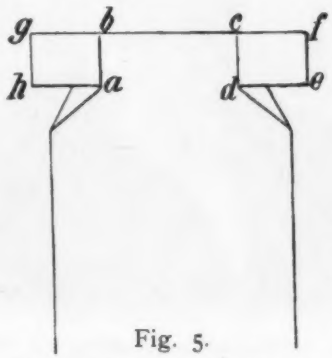


Fig. 5.

by a division of loops in the direction of the arrow, x, when a new row of loops is formed. In this manner the work goes on till the last rows of loops, e f and g h, have been knitted in the two heel parts of the stocking. The middle part of the frame-needle bar during this time must have moved so far in the direction of the arow, x, as is indicated by the length, c f, b g. At this moment the machine is stopped and the work interrupted for a short time and the workman attending the machine presses the hand-lever downward again into its non-working position. The eccentric allows the half-nut to become detached from the screw, and while the spring draws the slide-rest down to its lowest position the slide is moved back to the position Fig. 2—i. e., in the direction of the arrow, y—so that all the needles, n, attached to the three needle-bars again form a straight line.

This moving back of the slide the attendant may do by hand. The row of loops, g h and f e, are now taken off the frame-needles, n' and n^3; only the rows of loops, b c, which are accommodated upon the needles, n^2, remain on their needles; the two rows of loops, b g and c f, Fig. 4, are now run on those needles, n' and n^3, from which the rows of loops, g h and f e, were just taken off.

The stocking on the machine then fully resembles Fig. 5 of the drawings—that is, the rows of loops, g h, b c, c f, form a single straight line. From this moment the work is continued in the usual way. The foot part of the stocking is linked on as on a common knitting-frame and as if a division of the needle-bar into three parts had not taken place.

A KNITTING MACHINE NEEDLE.

An improved needle for knitting machines has recently been patented in this country, and is described as follows: The improvement relates to needles and levers in which

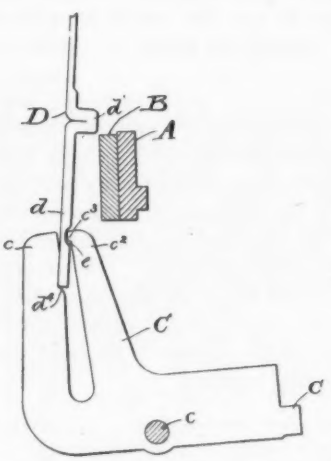


FIG. 1.

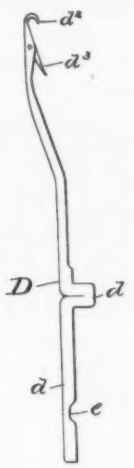


FIG 2.

each needle rests between the jaws of a lever, the needle being supported in line with the knitting-cams, but resting on a ledge extending around from the knitting-cams. By rocking a lever its needle is moved by con-

tact with the jaw inward out of line of the knitting-cams and is supported in that position by the end of the needle resting upon a ledge on the lever. In practice there is a tendency in moving these levers to throw these needles from operative position to inoperative position, and vice versa, and while in inopertive position for the needle to move upward, due to jar or otherwise, and thus releasing the loop from the latch, which is liable to close, and when again operated to miss a stitch, leaving a hole.

The new needle and lever are so constructed that the needle is held from upward movement during the rocking of the lever and when in position to hold the needle in inoperative position. Fig. 1 is a sectional view of the needle, needle-lever and a portion of cam-cylinder and portion of needle-ledge. Fig. 2 is a detail view of the needle.

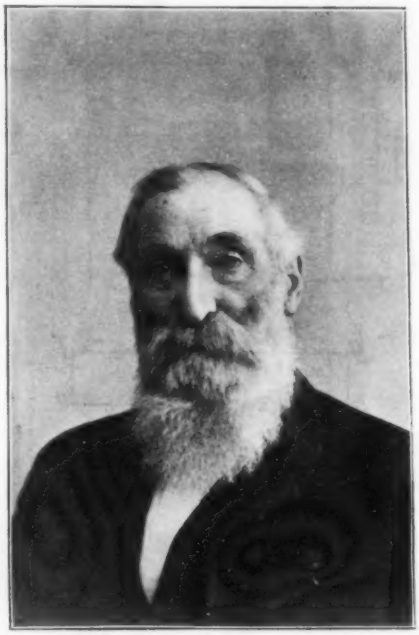
A is a portion of the cam-cylinder, and B the needle-ledge. C is a lever of the general character described in said patent, pivoted at (c) and having the tailpiece, C', for tilting it. This lever has the jaws, c' c^2, between which the shank, d, of the needle, D, having the butt, d', the hook d^2, and pivoted latch d^3, projects. In Fig. 1 the lever is tilted, with the needle moved so that the butt is off the ledge, B, and the needle supported by the shank resting on ledge, d^4, in lever-jaw, c'.

The needle-lever jaw, c^2, is provided with a rectangular projection, c^3, and the needle with an inset, e, on the edge of its shank portion. When the lever is tilted to the position shown in Fig 1, the projection, c^3, enters the inset, e, and pushes the needles from the ledge into inoperative position. The projection and ledge also coact in this movement and while the lever is in that position and in returning to operative position to hold the needle from moving upward.

The manufacture of the Paisley shawl, which began about 1820, was an attempt to imitate successfully the Indian cashmere shawl by producing effects on the loom which in the cashmere shawl were made with a needle.

WILLIAM HOWES MAYO.

In the death of William Howes Mayo, the knitting industry loses one of its most prominent inventors and a man who has done much for the development of the type of knitting machinery which has given prominence to America in seamless hosiery manufacture. He was born in Hampden, Me., October 18, 1819, and died in Laconia, N. H., February 26, 1905. Mr. Mayo was engaged in the lumber business on the Penobscot River in



WILLIAM HOWES MAYO.

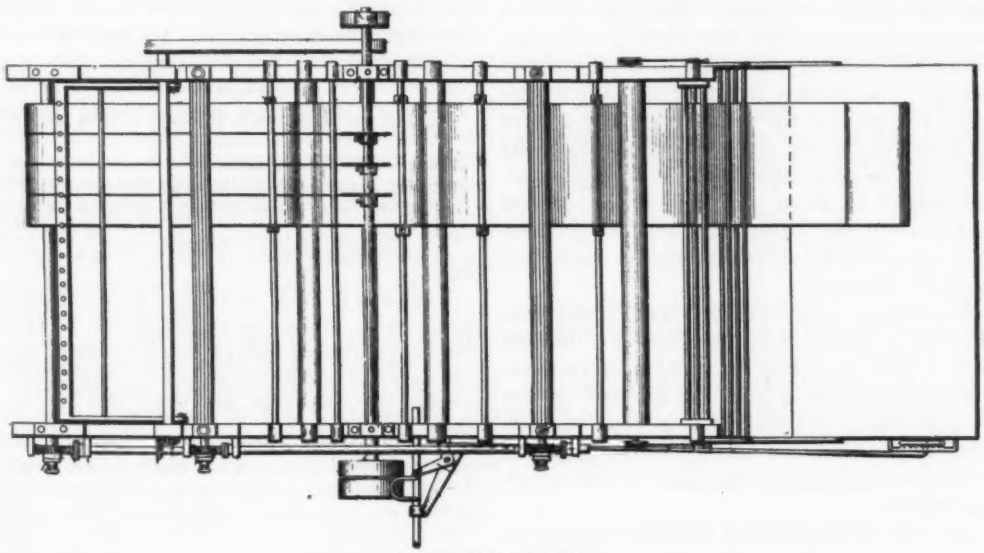
his younger days and in 1853 was a member of a lumber company owning and operating large tracts of land in Nova Scotia where he also engaged in trading and ship building for some fifteen years. He was a soldier in the Madawaska or Aroostook war and received a grant of land for services rendered in that campaign. He invented and built a great many machines principally for wood working, some of which were patented. About 1880 he became interested in the textile line and since that time has been well known in the knitting trade. Possessing a thorough knowledge of mechanics, he gave his best

thought to the subject of knitting machinery, and the result was the invention of the Mayo seamless knitting machine, which was put on the market in 1885 by himself and his son, George D. Mayo, who carried on the business under the name of the Mayo Knitting Machine Co., at Lynn, Mass. As time progressed, the merits of this machine, and the many improvements which were made to it, led to such an increase of business that the company was compelled to secure larger quarters. In 1889 they removed the business to Franklin, N. H., where a large machine shop was fitted up most thoroughly. In 1896 a stock company was formed and incorporated under the name of the Mayo Knitting Machine and Needle Co. In 1902 Mr. Mayo and his son disposed of their interests in the above company. When the George D. Mayo Machine Co. was established at Laconia, Mr. Mayo became a large stockholder, and took a great interest in the success of the new company. He was a man of very genial and kindly disposition and was loved and respected not only by his employees, but by all with whom he came in contact, either in business or socially. He was always ready with a kind word and substantial assistance for the unfortunate and needy, and his memory will be cherished by those who were fortunate enough to know him. Of him it can truly be said that his was a life well spent.

He lost his wife in 1872, and never remarried, but resided ever since either with his son or at his summer home at Swampscott, Mass.

A NEW KNIT GOODS CUTTER.

The elasticity of knitted goods makes it difficult to cut such fabrics into strips without more or less irregularity. To overcome this defect the machine shown in the illustration has been constructed, and recently patented in this country. It is claimed that the knitted material is maintained at a uniform tension while being fed through the machine, but is prevented from being subjected to undue tensile strain, which would reduce the width of the cut strips.



A KNIT GOODS CUTTER.

The cut strips are wound upon an arbor and held in separately so that the cut edges of one strip will not overlap the adjacent strip.

By means of a variable rotary motion for the guiding-rollers of the fabric, the material moves through the machine at a uniform rate of speed.

Fig. 1 is a plan view of the machine showing the fabric.

The frame of the machine is provided at

its front end with a shelf, on which the material to be cut is placed.

At the top and upon each side of the frame are vertically adjustable brackets, in which are mounted guide rods. On these rods are adjustable spacing guide blocks which engage the edges of the fabric to hold it against lateral movement, as shown in Fig. 1. These rods are preferably non-rotatable, and the fabric is disposed alternately above and below the same, there being a rod upon each side of the cutters and arranged so as to hold the fabric in a true horizontal position when the cut is made, the fabric passing beneath the rods opposite the cutters, and the cutters rotating in a direction to make an upward cut, so that the tendency of the cutters to force the fabric up will be overcome by these guide rods upon each side of the cutter shaft. In front and behind the cutters and beyond the guide rods are two rollers, over which the fabric passes as it is fed to and from the cutters.

Extending longitudinally and upon one side is a shaft, with bearings at suitable points, and on which is fixed a bevel-gear that meshes with a gear on the end of the counter-shaft. This shaft is geared to each feed-roller and to the take-up arbor, and constitutes a common driving shaft for the arbor and rollers.

In order to maintain a uniform tension on the fabric and at the same time prevent undue stretching, feed rollers, guide-rollers, and guide-rods are arranged at suitable points in the path of the fabric. At the front of the machine is secured a frame, preferably supported at an incline and capable of being adjusted in and out by means of a bolt-and-slot connection. This frame has a number of transverse bars, between which the fabric is guided preliminary to being fed into the machine to remove all wrinkles or undulations therefrom. On the front end of the machine is mounted a similar set of evening-bars, through which the fabric is twisted in and out or under and over alternately, as shown in Fig. 1. From these evening-bars the fabric extends down and around a tension-roller.

As the feed of the material must be uniform, so as to prevent the fabric from stretching or sagging and prevent the take-up roll from stretching the material as it increases in diameter, the friction worm-gearing on the shaft is so adjusted as to permit the worm-sleeve to slide loosely around the shaft and impart a variable rotation to the take-up arbor as the roll increases in diameter. The same action will take place with respect to the feed-rollers if the shaft is rotated faster than the material is wound upon the take-up roll, and thus a uniform tension is maintained on the fabric. The fluted surfaces of the feed rolls also feed positively the material through the machine and prevent the latter slipping around the feed-rollers.

Sizes for Women's Ribbed Union Suits.

Editor Textile World Record:

Please give a list of the different measurements for the various sizes of women's ribbed union suits.

West Branch (526).

A prominent knit goods buyer writes us as follows:

I know of no table of standard sizes for women's union suits. I find upon comparison of various lines being offered that every manufacturer makes his goods by a different standard. The most successful lines, however, are those that are made about as follows:

	4	5	6
Total length	54 in.	56 in.	58 in.
Length of body	30 in.	31 in.	32 in.
Inseam	25 in.	26 in.	27 in.
Bust	12 in.	13 in.	14 in.

Please note that the body length is taken from the middle of the shoulder to the crotch, whereas the total length is taken from the middle of the shoulder in a straight line to the ankle, which accounts for the difference of one inch between the total length and the body lengths added to the inseam measurements.

Fillmore.

The Length of Ribbed Garments.

How are the lengths of shaped, jersey ribbed, fleeced garments regulated, and how can one arrive at the proper allowance for shrinkage in napping, so as to have the lengths right for cutting to a certain size? We find such a variance in shrinkage from time to time that we have decided to knit the skirts of vests, and the plain stitch ankles of pants and suits an inch or two longer and let the cutters trim to correct length. Is this the usual method? It makes too much waste.

Tigellinus (498).

There is no particular rule to guide the knitter in regulating the lengths. It must be a matter for the practical experience of each knitter. There are so

many different causes that make a knitted shaped garment vary in length, that any theoretical rule that might be given would be of very slight service.

The size of the yarn, the gauge, the length of the stitch of the knitting, whether the yarn is heavy or light for the gauge, whether the cloth is knit with a tight stitch or a loose one, the amount of tension on the garments when being run through the napping machine, all of these cause lengths to vary.

Each knitter, therefore, must experiment for himself on the particular garment he is making, in order to arrive at the proper allowance for shrinkage. When he has thus obtained the correct length he should make a full memorandum of the size of yarn used, the gauge, the length of stitch knit, and the exact weight of the garment, for future guidance in case the size of the yarn or the weight of the goods should be changed or the knitted stitch be altered, all of which cause a variance in length.

Even after the knitter has ascertained the proper lengths, care must be taken to have the same tension on the knitted garments when running them through the napping machine, otherwise garments that have all been knit the same length will not be uniform after napping.

Even on goods that are not napped different allowances must be made for the shrinkage.

For example, take two lots of yarn, one being lighter by 3 grains per 12 yards than the other, and knit each with the same gauge and machine, and at the same length of stitch, and without changing the cams or burs, fully 3 inches more to a shirt will have to be allowed for shrinkage with the finer yarn.

If we take the same yarn and merely shorten up the stitch, no extra allowance will be required for the length.

The reason for this is apparent. If the yarn is light for the gauge, and the stitch loose, it is elongated in knitting, and therefore shrinks up afterwards, but if the stitch is tight, there will then be more courses of knitting in the same number of inches lengthwise, and, therefore, less shrinkage in length.

Again in jersey ribbed garments, in which the length of the garment and the changes of plain to tuck stitch are regulated by a chain driven by a wheel coming in contact with the cloth, the garment can be made shorter or longer, merely by changing the length of the stitch, and without altering the chain.

Again a slight change of yarn on the machine, without either altering the stitch or chain, will make a different length.

The knitter, therefore, in order to get uniform lengths on shaped garments, must adopt the size of yarn which gives the weight per dozen goods wanted at a certain fixed length of stitch, then a fixed number of links in chain, all of which must be ascertained by experiment on the particular line being made, and lastly a fixed tension when napping.

Usually employees who run the napping machine will pay very little attention to having the same tension on every roll of cloth of the same kind; the result is a great variety of lengths.

When more than one machine is being run on the same kind of garments, each machine must have exactly the same number of links in chain for length, and then each machine must be set to knit the same length of stitch, or the same number of courses per inch.

If this is properly done, there should be no necessity of allowing one or two inches for margin for the cutter, which is most decidedly an unnecessary waste.

Rewinding Cones.

Editor Textile World Record:

Does it pay to rewind cones before knitting?
Concord (530).

If the cones are carefully wound and handled it does not pay. If they are badly wound and have broken ends, rewinding is the only way out of the difficulty.

Recent Knitting Patents.

KNITTING MACHINE. Circular. 783,408. Asa C. Baum, Little Falls, N. Y.

KNITTING MACHINE. Hosiery. 784,882. Albert M. Pigeon, Philadelphia, Pa.

KNITTING MACHINE Take-Up. 784,567. Leon C. Huse, Laconia, N. H.

KNITTING MACHINE Striping Attachment. Circular. 778,164. William T. Barratt, Bennington, Vt.

The Ruth Knitting Machinery.

The Ruth Machine Co., York, Pa., report that the business outlook is very encouraging. New orders are coming in and they are increasing their working force, shipping machinery to different sections of the country. Their stop motion is attracting much attention, and has been approved by many knitting mill men who have used it. Their present line includes ribbers, sleevers, splicers, automatic stop motion, lace device, friction pulley, belt shift and Ruth needles. Their office and factory is at Lamour and Prospect Sts., York, Pa.

KNITTING MILL NEWS.

New Mills.

Georgia, Columbus. The Perkins Knitting Mills have been organized with capital stock of $75,000, privilege of increasing to $300,000. A new building will be erected for manufacturing all kinds of knit goods, cotton batting, rope, etc. Contract has been placed for 150 knitting machines, spinning machinery, etc. The Columbus Power Co. will furnish power. C. L. Perkins is president of the new company, Curtis Jordan, vice president and H. M. Wade, treasurer.

*Georgia, Dallas. Work will start about March 15 on erection of new building for the Dallas Hosiery Mill, recently reported incorporated with capital stock of $10,000. W. E. Spinks is president of the company. Plant will be equipped for making men's and ladies' gray hose and will be operated by steam. Efforts will be made to have the plant running by May.

Illinois, Chester. The Chester Knitting Mills have been incorporated with capital stock of $20,000, for purpose of making knit goods. J. H. Rickman, Allen A. Short and William Barnard are interested.

Illinois, Chicago. The Colonial Knitting Mills, capitalized at $50,000, have succeeded the Strauss-Cahn Knitting Co. E. B. Cahn is president and treasurer of the new company, and J. H. Wilson, superintendent. The plant is now running on men's ribbed underwear and union suits, with capacity of 250 dozen daily. E. J. Chaffee is the New York representative.

Massachusetts, Clinton. A small plant for manufacturing stockings has been established by Henry Dio. Two knitters, one ribber and one looper have been installed, also finishing machinery. The plant will have capacity of 14 dozen per day. For the present goods will be sold at Mr. Dio's store, but he will also fill orders.

*Montana, Helena. The Montana Knitting Mills expect to get their new plant started by the 15th of April. They will make all kinds of knit goods in wool, cotton and silk, making specialty of union suits, underwear and sweaters.

New York, Brooklyn. Six machines are being run by a Mr. Davidson at 402 Scholes Street on sweaters, blouses, etc. The production is sold direct.

New York, Wallonsburg. Eli Dupree advises us that the new concern in which he is interested, and for which he will be buyer, will be known as the Riverside Mills. They are not yet prepared to make a complete report. He says that he will need complete equipment for a knitting mill and nothing has been bought.

*North Carolina, Merry Oaks. At meeting held recently of directors of the Merry Oaks Hosiery Co., J. W. Boling was elected president, T. C. Lawrence, secretary and treasurer and J. E. Gunter, superintendent. Operations will be started with an equipment of 10 knitting machines to manufacture half hose.

*Pennsylvania, Doylestown. Operations have been started by Brewer & Drenk, making cotton hosiery, using 8 to 30 carded yarns. The mill is equipped with 30 knitting and 2 sewing machines, dye house, and operated by steam. Goods are sold direct.

*Pennsylvania, Millheim. The Millheim Knitting & Manufacturing Co., previously reported incorporated with capital stock of $20,000, has been put in operation, making men's, misses' and infants' goods. J. H. Hoffman is president of the company, agent and superintendent and A. A. Frank, treasurer. Mr. Hoffman formerly operated a plant at Shamokin.

*Pennsylvania, Myerstown. Operations have been started in the Myerstown Knitting Mills, Geo. A. Martin & Son, proprietors. This plant is equipped with 70 knitting machines.

Pennsylvania, Philadelphia. The International Silk Knitting Co. has just been incorporated for the purpose of manufacturing full fashioned hosiery of silk. The officers are Joseph Scholes, president, and William Geggis, 2551 Kensington Avenue, treasurer. Six full fashioned machines have been ordered from abroad and the plant will be started up as soon as suitable quarters are secured.

Pennsylvania, Philadelphia. The vitality Hosiery Co. is the name of a new concern which manufactures hosiery and socks with reinforced legs and soles for men and women, selling the goods through New York. The concern as yet does not operate machines of its own, but is having the goods made up by Messrs. Rosenau & Loeb, proprietors of the Liberty Hosiery Mills at 1626 Mascher Street.

Pennsylvania, Philadelphia. A small knitting plant is being operated by Messrs. Fowler Bros., as an experiment, at Hawthorne and Dyre Sts., Frankford, on hosiery with six or eight machines, the goods being sold direct.

Pennsylvania, Philadelphia. I. Reiser, at one time proprietor of the Malaga (N. J.) Knitting Mills, which were burned out several years ago, is manufacturing and finishing hosiery and underwear at 73 and 75 Laurel St. This concern does not operate knitters, using sewing machines only, on which they make "cut feet," buying the tops and feet from other manufacturers. They sell direct.

Pennsylvania, Reading. A new knitting concern is to be started here on or about May 1st, the title of the company to be Richard Meinig & Co. They will manufacture fine silk gloves on machinery which has been ordered abroad and is now on the way to this country.

Pennsylvania, Reading. The H. V. Wentzel Knitting Mills are making a specialty of knit goods for the shoe trade, such as moccasins and socks, together with ladies' coats, skirts, etc., and a general line of knit goods. At the present time they are buying the fabric in the piece and cutting it up into these various articles, but it is expected in the near future that they will install machinery for knitting fabrics on their own account.

Pennsylvania, St. Mary's. The St. Mary's Knitting Co. is operating a plant here in which they

manufacture men's socks, ladies' and children's hosiery and wristlets. C. F. Haas is the manager and buyer.

Tennessee, Morristown. The Bean Knitting Company is a new concern which will start operations April 1st, making men's all wool hose, coarse and medium. They will operate 12 knitting machines and sell goods direct. Later it is proposed to make children's ribbed goods. This is a partnership. G. A. Russell is treasurer for the new company, John B. McCord and C. O. Bean, the latter general manager. Company also operate woolen mill of one set and 16 looms.

*Virginia, Norfolk. The Norfolk Knitting Company has been incorporated with capital stock of $20,000. A plant for making ladies' winter weight ribbed underwear will be started in a mill which has been idle for some time. This is the project in which Frederick H. Brayton of Nyack, N. Y., is interested.

Enlargements and Improvements.

*Alabama, Gadsden. The new bleaching plant at the Adams Knitting Mills has been completed. It is reported that Mr. Adams is contemplating installing spindles for manufacturing yarns used.

Connecticut, Addison. Contract has been let by the Glastonbury Knitting Company for erection of a four-story addition to No. 1 mill.

Georgia, Cedartown. It is reported that the Cherokee Knitting Mills propose installing 10 Cooper knitting machines.

*Georgia, Grantville. The Grantville Hosiery Mills, recently reported having increased the capital stock to $150,000, will start work on erection of their new addition, April 1st. They propose having same completed about September or October, and will install 3,000 spindles at first, although building will accommodate 5,000. Yarns, 5 1/4 to 15 will be made.

Illinois, Chicago. The Dornbaum Knitting Co. has been incorporated with capital stock of $2,400. The incorporators are: Albert Dornbaum, S. A. Walther and Gideon F. Lanaghen. They will continue the plant formerly run by Mr. Dornbaum.

Massachusetts, Lowell. The Shaw Stocking Company is to install additional machinery (ordered) in the plant.

*New Hampshire, Laconia. Franklin P. Stewart, proprietor of the Union Hosiery Co., is removing his plant to the Copp Building at Tilton. Will manufacture his own yarns in new location.

*New Hampshire, Tilton. The Union Hosiery Co., F. P. Stewart, proprietor, will start operations April 1st, making wool and merino hosiery for men, women and children. Plant is equipped with 2 sets cards and 25 knittting machines and was formerly located at Laconia.

New Jersey, Haddonfield. The Estaugh Knitting Mills have been incorporated as the Estaugh Knitting Mills Co., with capital stock of $25,000. Robert T. Wood is president of the company, and Frederick J. Elliott, treasurer. This plant is operated on ladies' vests.

New Jersey, Little Falls. Additional machinery is being installed in the Lotus Knitting Mills, George Jackson, proprietor.

New York, Averill Park. The Faith Knitting Company is making improvements to the mill. Several new spinning machines have been put in.

*New York, Richfield Springs. The Waiontha Knitting Co.'s new plant has been completed and operations started in same.

New Jersey, Riverside. Plans have been prepared for a new dye house 150 by 40 feet and a drying house 220 by 40 feet, both being built of brick, one story high, for William F. Taubel, manufacturer of men's, women's, misses' and infants' cotton and worsted hosiery on 1,025 knitters. This department when completed will be equipped with the latest improved machinery for dyeing and finishing and will be under the direction of Mr. Henry Taubel, who has had charge of this department for many years. In the old dyehouse knitting machinery will be installed which will enable them to increase the capacity of the plant one-third.

*New York, Greenwich. The Jesse V. Palmer Company, recently organized with capital stock of $50,000, will operate the plant formerly known as the Van Zile Knitting Co. An addition has been built to the plant and additional machinery installed. Operations will start in a few days with full capacity.

New York, Saratoga Springs. The Olmstead Mfg. Co., E. R. Olmstead, owner, is to enlarge the plant, which manufactures fancy knit slippers. It is stated that a stock company will probably be formed to operate same.

North Carolina, Burlington. The Burlington Hosiery Mills have secured the building formerly known as the Farmers' Warehouse and will remove to same. New engine and boilers will be put in and additional knitting machinery.

North Carolina, Kernersville. The American Hosiery Mills have just placed an order for 16 additional knitting machines and ribbers to make 84 needle hose.

Ohio, Piqua. The Atlas Underwear Company will erect a new building, three stories and basement, brick. Plant will be equipped with electricity. The new building will also be equipped with various departments for benefit of the employees, such as a reading room, lunch room, etc.

Ontario, Dunville. Additional machinery is being installed in the Monarch Knitting Company's plant, manufacturing sweaters, golf vests and lumbermen's socks.

*Ontario, Hamilton. The Eagle Knitting Company has purchased property upon which they will erect a new knitting mill.

Pennsylvania, Allentown. The Southdown Knitting Co. has purchased the plant operated under partnership with E. H. Godshalk and the Wright's Health Underwear Co., 23d and Hamilton Sts., Philadelphia, and will remove same to Allentown, where they will manufacture eiderdown in addition to underwear.

Pennsylvania, Glen Riddle. The hosiery mill started here by Samuel B. Rhodes has been shut

down, owing to cancellation of orders. During the shut down machinery will be installed for making underwear and other knit goods.

*Pennsylvania, Newport. Work will start April 1st on new addition to be built to H. A. Romberger's hosiery mill. Twenty new machines will be installed. It is expected to have the new addition completed by June 1st.

Pennsylvania, Philadelphia. William F. Taubel, manufacturer of men's, women's, misses' and infants' cotton and worsted hosiery, with branch mills at Tamaqua and Shamokin, Pa., has rented quarters in the Ontario Mills, 2d St., above Columbia Ave., which he is now fitting up and will operate in conjunction with his other plants.

Pennsylvania, Philadelphia. John E. Pike, who about one year ago started up a plant for the manufacture of high grade athletic knit goods, sweaters, cardigan jackets and baseball hose, at Mascher and Oxford Sts., with 6 latch and 1 sewing machine, has removed to much larger quarters at the northeast corner of Second and Diamond Sts., where he has taken over the entire second floor. He is now manufacturing high grade athletic stockings which he sells direct.

Pennsylvania, Philadelphia. The United States Knitting Co., which has been located at 426-28 Market Street, has removed their business to Dock and Walnut Streets, where the firm is now known as the Goldblatt & Busch Knitting & Fur Co. They manufacture worsted and woolen sweaters and blouses on 40 latch needle knitting machines and 28 sewing machines, selling the production direct. The plant is run by steam and hand.

Pennsylvania, Reading. Eight new knitting machines have been installed in the Manheim Hosiery Mills.

Pennsylvania, Slatington. A new addition is to be built to the Crystal Knitting Mills, W. A. and H. Muschlitz, proprietors.

Tennessee, Chattanooga. The Chickamauga Knitting Mills are reported as contemplating erection of large addition to their mill.

Tennessee, Sweetwater. The Sweetwater Hosiery Mills have recently installed 36 new knitting machines and 9 ribbers in the mills.

Mills Starting Up.

*New Hampshire, Lakeport. H. B. Clow & Sons have purchased the Frank P. Holt Manufacturing Co.'s plant at Laconia and will start operations there at once. Arrangements have been made to do carding and spinning in building formerly occupied by L. M. Gould.

*New York, Depew. The knitting mill at this place is rapidly getting into shape to start up. It will probably be in full operation the 1st of April. Mr. George Davidson, formerly of Elyria, Ohio, is the superintendent.

Mills Shutting Down.

New York, Rochester. The Ideal Knitting Mill has been closed. Scarcity of help is given as reason for shut down.

*Ohio, Hamilton. The Pioneer Knitting Mills, closed about a month ago, are reported to go out of business.

Pennsylvania, Conshohocken. Lewis E. Taubel's plant at this place has been closed and machinery removed to mill at Norristown.

Rhode Island, Woonsocket. The Glenark Knitting Mills will close the plant April 1st for 10 days. This is the annual shut down, during which needed changes will be made to the machinery.

Facts and Gossip.

Connecticut, Derby. The A. H. & C. B. Alling Company has been incorporated with capital stock of $300,000, to take over business of the C. B. Alling Estate, operating the Paugasset Mills (underwear and hosiery).

*Connecticut, Hartford. The Reliable Manufacturing Company has been incorporated with capital stock of $10,000. Walter J. Roberts is president of the company and James Govan, treasurer. The plant has been removed from New Bedford, Mass., to this place.

Massachusetts, Lowell. The Pickering Knitting Company, which has been running on short time for several months, is to be run on full time.

New York, Kinderhook. The Elk Knittting Mill is to remove the plant to another locality owing to unfavorable shipping facilities.

New York, Troy. The Roff Underwear Company has been incorporated with capital stock of $100,000. It is understood that the new company will take over the mills operated by Isaac Roff at Troy and Cohoes, making underwear. Messrs. Isaac, Fred and A. A. Roff are the directors of the new company.

Pennsylvania, Allegheny. C. S. Timblin, 107 Harrison Avenue, Allegheny, is considering the question of starting a small hosiery mill, and is desirous of getting information on the subject, the cost of machinery, etc.

Pennsylvania, Birdsboro. The plant formerly operated by Smith Bros. will hereafter be known as the Pine Hill Hosiery Mills. Mr. J. M. Prutzman is treasurer for the new company.

*Pennsylvania, Philadelphia. The Ponemah Knitting Mills have been sold out by A. Freeman & Son, auctioneers. The machinery has been sold to various Philadelphia mills.

Pennsylvania, Plymouth. Ambrose West is reported as contemplating erecting a large mill on property recently secured near present plant.

Pennsylvania, Watsontown. The Watsontown Knitting Co. are busily engaged in operating their 85 knitters on 172 needle goods. They manufacture an extensive line of men's half hose and to fill the many orders on hand it is necessary for them to run their plant extra time to keep up with same.

West Virginia, Elmgrove. It is reported that Sheldon & Co. of New York have purchased a factory building at this place and will install machinery for manufacturing knit goods and shoe insoles of wool and cork. A company will be organized to operate the plant.

New Machinery and Processes.

This department is designed to present from month to month a brief mention of new machinery, devices, and processes being brought out in this country and abroad, that are of interest to textile manufacturers. It is not a list of patents, but of improvements coming on the market. The idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.
We invite machine builders and others to send us such information for this department.

Improved Northrop Loom. The Draper Company, Hopedale, Mass. An important loom, called the "L" Model, described in this issue.

A New Silk Loom. The Mason Machine Works, Taunton, Mass., are bringing out a new drop box loom for broad silk weaving. The Mason plain silk loom has been taken as a basis for the new loom and such modifications made as are necessary to adapt it to two and four box work.

A New Machine for Indigo Dyeing. H. A. Metz & Co., New York City. A simple form of dyeing machine to be used in connection with the indigo vat M L B for wool. It is recommended on account of the ease in handling raw stock and the quickness with which the liquor can be removed from the goods. Both of these points are of importance in the production of clean shades free from crocking.

Warp Tying Machine. Barber-Colman Co. The Barber warp tying machine for tying-in warps, instead of drawing in or twisting in by hand, is now being introduced to the trade. Work has been in progress on this machine for a number of years so that when ready the machine would work satisfactorily under mill conditions. We understand from manufacturers who have been using the machine that it is doing the work claimed for it. The advantages of such a machine have long been apparent, and inventors have been studying this problem for many years. The success of the Barber knotter, introduced by this concern, leads the trade to expect an equal success with the warp tying machine. Information concerning it may be obtained from Barber-Colman Company's office at Rockford, Ill.

Shaping Ribbon. V. Gierlings, Dulken, Germany. A machine for shaping ribbons for trimming purposes. A description appears in this issue.

Warp Let Off Motion. Schelling and Staubli, Horgen, Zurich, Switzerland, are bringing out an improved warp let off motion for looms which is claimed to give very uniform results and can be easily adjusted. The device is independent of both the floor and the frame of the loom.

Velvet Cutting Machine. The Cotton Cord and Velvet Cutting Machine Co., Huddersfield, England. A machine for cutting cords and velvets. It is said not only to exceed hand work in production, but also in the quality of the work. It can be adapted to existing machines so that manufacturers can install it at a small cost.

Self Threading Shuttle. P. Maechtlin, Mulhouse, Germany, has recently brought out a self threading shuttle designed to avoid the necessity of sucking the thread through the shuttle eye.

Drying Cylinder. Bentley & Jackson, Bury, England, have adopted an ingenious device for removing the condensed steam from drying cylinders. It is shown in another part of this issue.

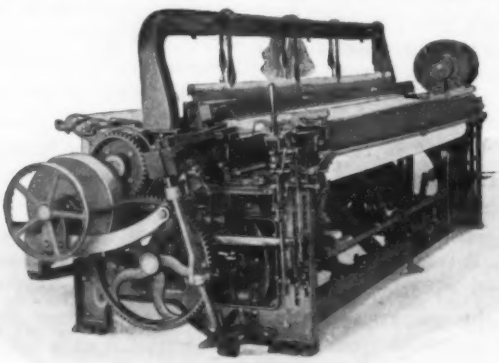
Cloth Spreading Rolls. Deutschen Waffen und Munitions-fabriken, Carlsruhe, Germany, have recently placed on the market an improved roll for spreading and removing wrinkles from cloth fed into machines. Beginning in the center, spiral ribs run to both ends of the roll, and the improvement consists in the method by which the ribs are fastened to the roll. They are pressed into the metal and rivets are thus avoided.

THE "L" MODEL DRAPER LOOM.

The Draper Company, Hopedale, Mass., are building an improved broad loom, called the "L" model, and designed to weave cloth from 72 to 108 inches in width.

It is driven from an auxiliary shaft, with pulley geared to run at higher speed than the crank shaft, thereby producing great ease in operation; in fact, one observer said that it ran as easy as a 40-inch loom. It is driven through a clutch pulley, and stopped with a band brake, to which especial attention is called.

The pick motion on a broad loom requires careful study. The Draper Company has made a long line of experiments on their rocker motion and shuttle box design. They use a front binder exclusively, with long shuttle box and lengthened shuttle. When weaving two beams, a compensating, compound let-off is used.



THE "L" MODEL DRAPER LOOM.

The crank shaft is of great strength, being 2 1/4 inches in diameter. The lay and reed cap are also of extra strength. A new warp stop-motion with cotton harness is applied to this loom, having a new indicating device which allows the weaver readily to discover the broken warp end. Although not shown in the cut, the new foot shipper-motion is applied, which is an auxiliary shipper near the hopper end of the loom, operated by the foot so that the weaver may stop or start the loom from the hopper end, without walking over to the shipper end. In broad loom weaving this saves appreciable time.

All of the latest filling-changing devices will be applied to the new loom which is shown in the accompanying illustration.

Among the orders received by the Draper Company since Jan. 1st, 1905, are orders for Northrop looms from the Wamsutta Mills, the Pacific Mills, and the Amoskeag Mfg. Company, three of the most representative concerns in the North. From the South, new orders have come from former customers, like the Monarch Cotton Mills, the Rosemary Mfg. Company, the Lanett Cotton Mills, and the Glenn-Lowry Mfg. Company. Also orders from new customers; the Palmetto Cotton Mills and the Thomaston Cotton Mills. The present order of the Pacific Mills increases their total orders to about 3,000 looms in all, making them the second largest customer to date for Northrop looms. The Pacific Mills took 100 looms out of the first lot manufactured for the trade, and their continued orders are certainly good evidence of satisfaction.

The Paisley shawl warehouses were for the most part situated in Causeyside street. The salesmen, always well dressed, might be seen in black surtout coats and shining satin hats, with a flower in the button hole, lounging at the front doors on the lookout for buyers. When they did find a customer, they smilingly took him in to inspect their stock, and the transaction often ended by a walk up to "Peter's" for a social glass.—Matthew Blair, in "The Paisley Shawl."

RUBEROID ROOFING.

The first Ruberoid roofs were placed on factories many years ago and are still giving satisfactory service, thus proving the great durability of this kind of roofing. It is strong and elastic and contains no tar or rubber. Among the other claims made for it are that it will not melt or rot and is more durable than either tin or shingles, and much less expensive. It does not require painting when applied and costs little for repairs. No skilled labor is required in its application; an ordinary mechanic can do the work, for which nails, tin caps and cement and full directions are furnished by the manufacturers. It is suited for all climates and is not affected by high or low temperatures. It emits no odor and does not in any way contaminate the rain water which runs over it. It is suited for either a flat or a pitched roof and it is said that owing to its not absorbing the sun's rays the rooms underneath the Ruberoid roof are cooler than those under a metal or shingle roof. The manufacturers state that architects and builders of the highest standing are recommending this roofing and that the United States Government has over 3,000,000 square feet on buildings in the Philippines, where, as is well known, the climatic conditions are extremely severe.

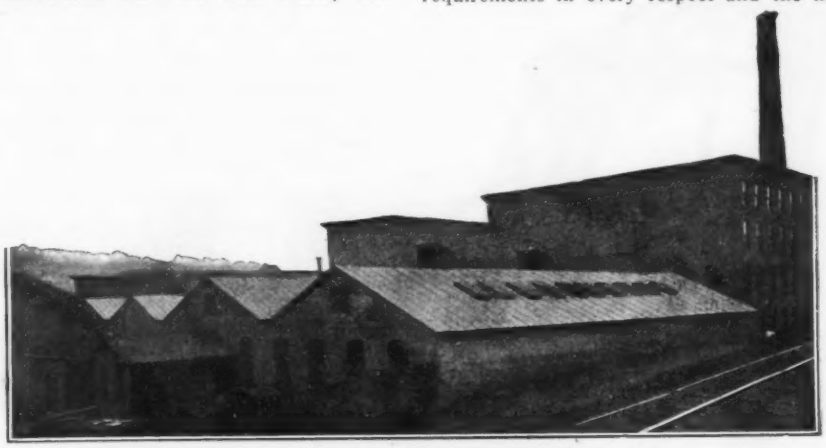
It has been in use on foundry forges and chemical buildings, resisting the heat, acid fumes and torsional strains. Our illustration shows the Hall Worsted Mills, Jamestown, N. Y., covered with Ruberoid roofing. The following letters from firms who have had this roofing in use for many years are convincing as to its merits:

The Standard Paint Company,
100 William St., New York City.

Dear Sirs:—

Over five years ago I ordered from you a quantity of Ruberoid roofing for covering my dye houses in this city. The roofs of these buildings are subjected to the severest conditions. The steam and acid fumes arising from the dye rooms, combined with the excessive heat, render the most trying test. It gives me pleasure to inform you that Ruberoid roofing has thoroughly met these requirements in every respect and the material is not in the least way impaired after undergoing this severe strain. Further, I have been put to little or no expense for repairing or painting the roofing during this time.

Yours truly,
Virgil Thurkauf.



RUBEROID ROOFS OF THE HALL WORSTED MILLS, JAMESTOWN, N. Y.

New Haven, Conn., May 6, 1903.

The Standard Paint Co.,
100 William St., N. Y. City.

Gentlemen:—The Ruberoid roofing which you laid for us eleven years ago has given entire satisfaction. Since then we have replaced all our tin, gravel and felt roofs with Ruberoid roofing; have never expended anything for repairs and all are in first-class condition.

Its waterproof and heatproof qualities have been severely tested on our buildings, and in view of its remarkable durability, we consider it everything that could be asked for in a roof covering.

Yours very truly,
The Seamless Rubber Co.
James A. Murray.

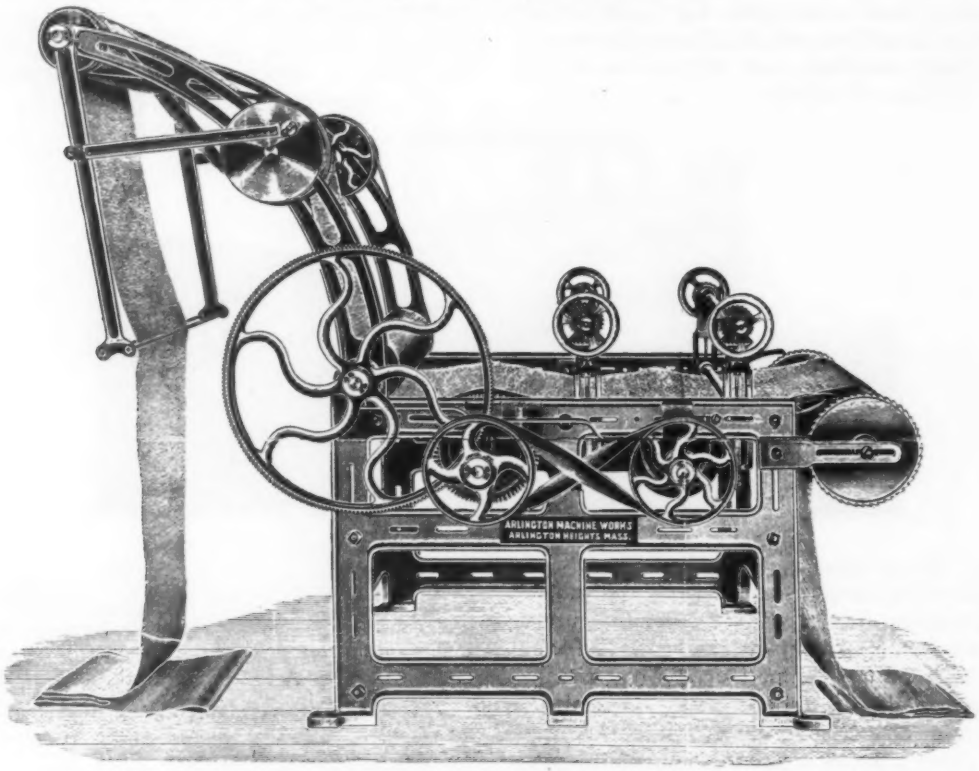
Further information in regard to it can be obtained upon application to the sole manufacturer, The Standard Paint Co., 100 William St., New York City.

A BRUSHING AND MOTING MACHINE.

An increase in the cost of cotton is usually accompanied by the appearance on the market of inferior fibre, which cotton manufacturers are compelled to use in order to keep the cost of production down. In the case of a scarcity of the raw material, almost any kind of stock will be purchased by manufacturers in order to keep the mill running.

This state of affairs is only what might be expected, for not only does a poor crop often mean that the fibre raised is of poor quality, but the increased prices demanded for the same, bring all kinds of inferior stocks on the market. During the past year we have had a practical demonstration of this state of affairs, many mills being compelled either to take inferior cotton, or do without it altogether.

The result in such cases is bad and dirty yarn, and this necessarily leads to inferior cloth, which must either be sold as a lower quality, or else improved in such a manner as to make it bring a higher price. This improvement in appearance, while it means another process, is usually a more economical proceeding, where possible, than to sell the goods at a lower figure. The machine which we illustrate has been introduced by the Arlington Machine Works, Arlington Heights, Mass., for clearing the cotton fabrics of both dirt and the motes.



A BRUSHING AND MOTING MACHINE, ARLINGTON MACHINE WORKS.

Two styles of these machines are made, the one we illustrate is for treating one side of the cloth only. The other will clean both sides of the cloth at one operation. The choice depends upon the output required. A double machine will do double the work, but the single one will do equally as good work by treating each piece twice, first on one side and then on the other, and is usually large enough for medium sized plants.

In the machine shown the cloth first passes

over adjustable tension bars, whose position may be varied to suit the strength of the cloth, and which are secured by means of a ratchet wheel and pawl. The fabric then passes over an emery roller and brush, both of which run at a very high speed, and either grind off or brush out the motes and other impurities present. The cloth is drawn over these rollers by means of the draw rollers shown, after which it is folded in the usual manner. The cloth is brought into contact with the emery rollers and brushers, and the pressure regulated by means of the hand wheels and screws shown.

The Arlington Machine Works, of Arlington Heights, Mass., the well known builders of textile finishing machinery, are introducing this machine into this country, and as usual with all their machines, this brushing and moting machine is built of the very best of materials, and the workmanship is first class. They will be pleased to hear from interested parties and to quote prices.

THE BOND PATENT LUG STRAP.

Fig. 1 shows the Bond patent lug strap manufactured by Charles Bond, Philadelphia, Pa. The inside strip of leather is riveted to make a hump or cushion. This inside strip is then formed in the shape of a lug strap and an outside strap is cemented to it to give the necessary strength.

Fig. 2 shows the finished strap. The man-

FIG. 1.

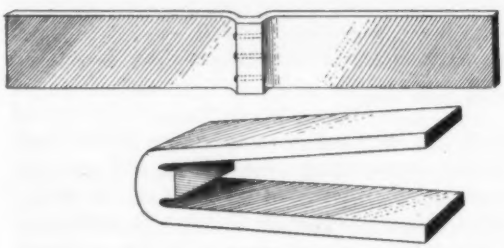


FIG. 2.

ufacturers claim that with the old style of lug strap it is impossible to secure the full benefit of the leather used in its construction, the picker stick wearing out the end of the strap long before the other portions of the leather are materially affected. Many efforts have been made at different times to strengthen the strap at this, its weakest point, and the Bond lug strap is believed to accomplish it effectively. The hump provides an excellent cushion for the picker stick and is said to stand the wear and tear of the stick for months. In addition to making a saving on straps, the cushion prolongs the life of the picker stick, and there is also less time lost in making changes and repairs.

A NEW STURTEVANT GENERATING SET.

Originally built by the B. F. Sturtevant Co., of Boston, Mass., for the use of the United States Government and in accordance with specifications of the Bureau of Equipment, this generating set possesses features of special interest.

The engine is of the high speed reciprocating type, designed to run at 630 revolutions per minute. The cylinder which is cast with the frame is 4 1/2 inches in diameter and 4 1/2 inches stroke. The valve is of the balanced piston type, and is operated by a Shepherd governor attached to the fly wheel. Quick action and regulation within 1 1/2 per cent. from full load to no load is secured. The piston is secured to the rod by a taper fit, while the rod itself is held to the cross-head by a set nut. The cross-head which is of the slipper type with forked and connecting rod, has a pin 1 1/4 inches in diameter by 1 3/4 inches long, while the crank pin is 2 inches in diameter by 2 1/2 inches long, and the main bearing is 1 15/16 inches in diameter by 6 inches long.

A neat cast iron frame suitably lagged encloses the entire engine. The frame is pierced for a large door on front which provides ready access to the interior, and also serves to confine the oil within the case.

The engine is remarkably silent in its working and is of a type especially desirable for modern yachts and similar service.

The generator is of the eight-pole type, designed for a continuous output of 5 k. w. at 650 r. p. m. The magnet frame is of the best grade cast iron to which are attached by through bolts the pole pieces of wrought iron with cast iron shoes. Each pole piece is energized by its own field coils which are eas-

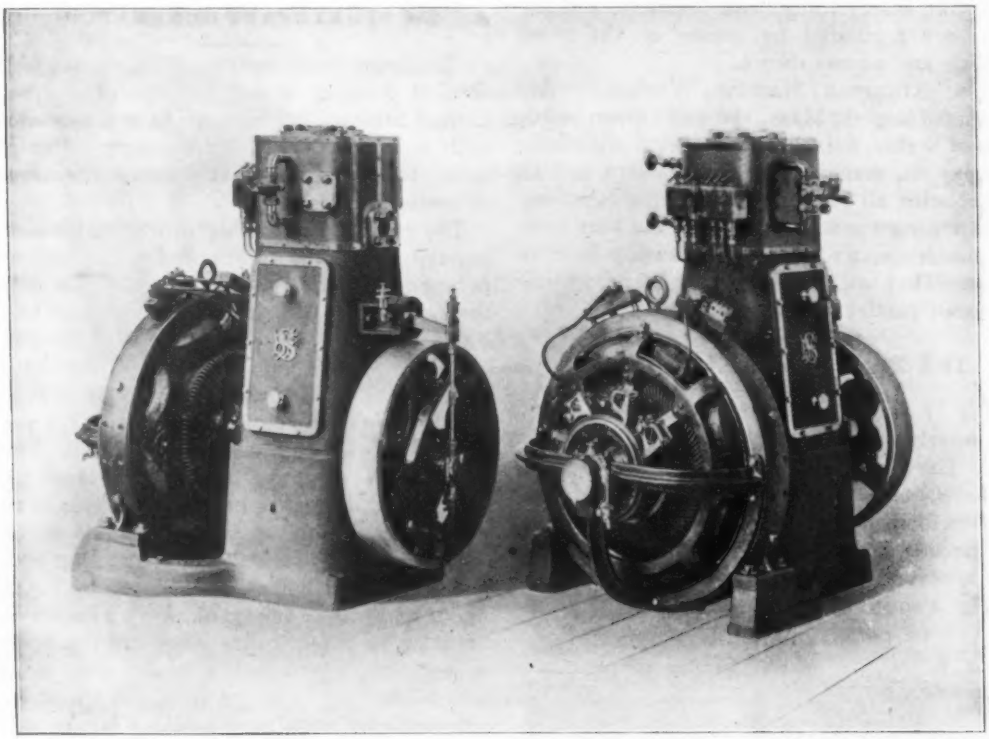
ily removable. The armature is of the iron-clad, two-circuit form wound, ventilated drum type, having a core of special low steel mounted upon a cast iron spider which has a hub extension for the support of the commutator. The armature coils are form wound and insulated with such material as shall not be perceptibly affected by heat or ordinary atmospheric moisture.

The commutator consists of bars or segments of pure drawn copper, secured in a cast iron shell of spider construction and clamped with a steel ring. The insulation between the segments consists of the best quality selected mica, and the end insulation consists of vulcanite rings. The brushes are mounted upon studs which project from a brush rigging attached directly to the magnet frame; this ring being so arranged that it may be rotated for adjusting the position of the brushes. The brush holders are of the sliding socket shunt type, each brush being supplied with a flexible connection and having a carrying capacity not exceeding 30 Amps. per square inch. Each brush and holder may be separately adjusted, and are readily removable for cleaning and repairs.

The generator is capable of carrying 50 per cent. overload for short periods of time, without shifting of brushes or flashing at commutator, and is capable of continuous operation at 25 per cent. overload without sparking or undue heating.

After a continuous run of ten hours, at full load, the increase in temperature above that of the surrounding atmosphere will not exceed 40° C., in any of its parts. The insulation resistance is such that it will withstand a breakdown test of 1500 volts for a period of one minute and shall show a resistance of at least one megohm with an initial voltage of 500.

The total weight of the set, which includes the engine, generator and sub-base, ready for operation, is 1140 pounds.



A NEW STURTEVANT GENERATOR SET.

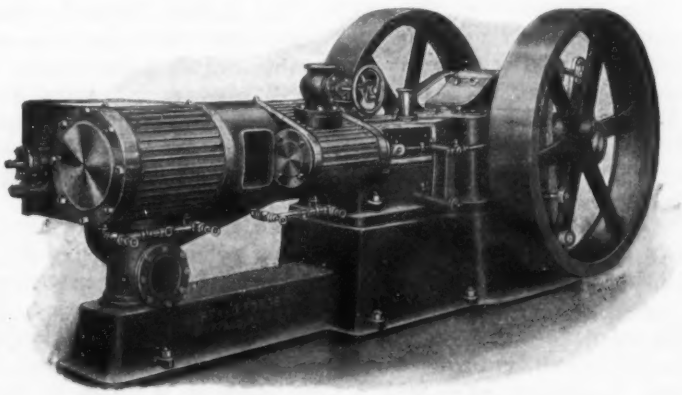
The first power loom in the United States was set up at Waltham in 1815.

A COMPOUND ENGINE TEST.

In order to determine the water consumption, mechanical efficiency, speed regulation and running qualities of the compound engine built by the Buffalo (N. Y.) Forge Co., Prof. R. C. Carpenter recently made some thorough tests, and the following is an abstract of his report:

The engine is one known by the builders as a class "A", 12 and 18 by 10 horizontal tandem compound high-speed engine. It has the high pressure and low pressure cylinders acting through a continuous piston rod, upon the same crank pin. The high pressure cylinder is on the crank end, with the low pressure cylinder beyond it, away from the crank. The engine is connected through about 20 feet of 7-inch exhaust piping, with two elbows, with a surface condenser. It was found that the vacuum could be carried as high as 25 or 26 inches. The brakes used were of the well-known Prony pattern. They were constructed of small wooden blocks, placed about three inches apart around the surface of the wheels, and connected by three one-inch ropes. The ropes were connected to blocks and tightening screws at the ends, and were screwed up until any desired load was obtained. The brakes were lined with thin sheet-iron, and the surface of the wheels was lubricated from time to time with cylinder oil applied with a brush. The wheels were of the internally flanged type, and the rim was filled with water, and the outside of the brakes wet from time to time with a hose. The method followed in making the test was as follows:

The engine was started up and allowed to run for at least an hour before the actual test was commenced. During this time the brake load was adjusted, and the speed of the air pump was regulated to give the desired reading of the vacuum gauge. The oil supply was regulated and at the end of the hour, if conditions were seen to be favorable, the actual test was commenced. The brakes were carefully watched all the time to see that they held the load constant. One man was detailed to attend the air pump and keep the vacuum gauge reading constant at the desired figure. One man was detailed to take the indicator cards and the readings from the various gauges and calorimeters on the engine, and one to weigh the water and keep the log of the test. The engineer in charge exercised general supervision and took the revolutions. A preparatory signal was given half a minute in advance of the time for each reading, and at the exact interval another signal was given, and all observations taken simultaneously. The actual time of each test was two hours, this not including the preliminary hour's run. When enough time was available a second run was commenced as soon after the completion of a run as a new brake load could be secured, and conditions had become constant under this new load.



"CLASS A" COMPOUND ENGINE. BUFFALO FORGE CO.

Runs were made in the above manner at no load, thirty, sixty, ninety, one hundred and twenty and one hundred and thirty horse power. Rough computations were made during the run of the water rate, and the test was discontinued after the one hundred and thirty horse power test, as it was found that at that load the water rate began to rise. The above runs were all made non-condensing. At the conclusion of this part of the test, additional runs were made at sixty and one hundred and twenty horse power, condensing.

The engine was fitted with one of the builder's latest form of governor, the one which is at present furnished with all engines of this class. The load was applied by means of two planks, used as levers against the fly wheel. In this way it was possible to test the governor action under sudden shocks by suddenly applying or releasing the load. The steam pressure during all the tests was kept as close as possible to 125 pounds, but because of changing demands of other machinery connected to the same boiler plant, it varied at times from 110 to 140 pounds. The steam pressure was taken from a gauge just above the throttle valve. The quality of the steam was taken with a throttling calorimeter, just before the steam entered the throttle. The engine was situated some distance from the boiler from which steam for the test was taken, but the steam at the engine was found to be very nearly dry and saturated throughout the test.

The results of the tests are summarized as follows:

Indicated H. P.	7.15	37.47	69.55	92.11	121.66	138.63
Delivered H. P.	0.00	27.01	56.48	83.00	113.92	128.66
Steam per I H. P. per hour	125.83	32.35	24.68	23.42	22.32	22.83
Mechanical Efficiency, %	0.00	72.08	81.10	90.20	93.00	92.80

The above is for the non-condensing runs and the steam consumption is figured for dry steam. Computations were made to determine the additional saving that would have been made with 27-inch vacuum, instead of the lower vacuum that could be obtained during the test and the actual and computed tests for the condensing runs may be summarized as follows:

	Actual	Actual	Computed	Computed
Indicated H. P.	63.33	116.38	74.67	127.8
Delivered H. P.	54.80	106.94	....	....
Steam per Indicated H. P. per hour	21.34	19.14	19.00	18.00
Mechanical Efficiency	86.60	92.00	....	....

The Buffalo Forge Company had this test made that they may demonstrate by irrefutable evidence the merits of their engine. A detailed statement of Prof. Carpenter's test will be mailed upon application.

AN IMPROVED DRYING CYLINDER.

The accumulation of condensed steam in drying cylinders is often the cause not only of much trouble, but may result in great damage if not properly met. Various devices have been invented for getting rid of this water, but one of the latest, and also one of the simplest, is shown in the accompanying illustration. A piece of sheet metal of Z section is fixed spirally around the interior of the drying cylinder, and thus forms a gutter or channel which commences at one end of the cylinder, and after one or more turns discharges into a bucket at the other end. It will be readily seen that any accumulation of water, however small, is at once swept rather than ladled out of the cylinder. There can thus be no drippings in the bottom, and the steam has free access to the cylinder casing in every part.—Textile Manufacturer.

A DRYING CYLINDER.

Dyeing, Bleaching, Printing, Etc.

THE DYIENG OF CHEVIOT YARNS.

This particular class of yarns is extensively used for the manufacture of a great variety of fabrics, and specially so for fabrics that are more or less figured. As a general rule, the greater portion of these figured goods are made from yarns that were white, while some are made from previously dyed yarns, the piece being afterward dyed a light or medium shade. Owing to the general good quality of the material employed, it becomes necessary for the dyer to make use of colors and processes that will yield shades of the greatest possible fastness, not only to exposure, weather, etc., but to milling and fulling.

The first and most commonly used process is as follows: Prepare the dye bath at a temperature of 120 deg. F., and if the water is in any way hard, neutralize the lime by the addition of oxalate of ammonia, varying in quantity from 1/4 to 1/2 pound for each 100 gallons. For light shades, add:

Cryst. Glauber's Salt, 10 per cent.
Ammonium Acetate, 5 per cent.

while dark shades require:

Cryst. Glauber's Salt, 10 per cent.
Acetic Acid, 1 to 2 per cent.

together with the proper quantity of dyestuff. Enter the yarn, and gradually raise the temperature to the boil, and after half an hour, add from 2 to 5 per cent. of acetic acid, somewhat diluted, in two or more portions. This is necessary to ensure proper exhaustion. When the color has all been taken up by the yarn, add to the bath, after cooling to about 150 deg. F., a quantity of bichromate of potash, equal to one-half the weight of the dye used, turn evenly and regularly for 20 to 30 minutes, during the increase of the temperature again to the boil, then lift, wash, and dry.

This dyeing process is a very good one for several reasons; it is quite simple and does not require special or unusual chemicals, the dyes (below enumerated) are taken up gradually by the fibres, and the after treatment with chrome ensures complete fixation of the shade. A possible disadvantage is the uncertainty of producing a dead match for a given shade, but the experienced dyer will have no trouble, provided he makes a trial upon a smaller scale, and uses the exact proportions thus found in his regular dyeing.

The dyes available for this process are:

Anthracene Yellow B N, C, and R.
Anthracene Blue C.
Anthracene Acid Brown G, N, S W and other marks.
Diamine Fast Red F.

These various colors can be used in combination with each other, so that the dyer is able to produce a very extended series of shades. The use of Diamine Fast Red F in this connection may surprise many dyers when it is known that it is more correctly a direct dyeing cotton color, but as it is only slightly acted upon by dilute acids, not affected by chrome, and is taken up very thoroughly by wool, it is seen how it can be used in the present series.

A method for dyeing black upon this yarn is as follows: Prepare the dye bath with:

Crystal Glauber's Salt, 10 per cent.
Acetic Acid, 5 per cent.

with the proper quantity of dye, which may be about 4 or 5 per cent., according to intensity. Raise the temperature gradually to the boil, and after three quarters of an hour, add from 3 to 5 per cent. of bisulphate of soda in two or more portions, and after 15 minutes further boiling, add about half the weight of dyestuff in fluoride of chrome and continue boiling for 20 minutes additional, lift and wash.

The dye here available:

Anthracite Black B.,

and for shading use

Formyl Violet 10 B.

While bichromate of potash could be used in this process, the best results are obtained with the fluoride, a chemical very easy to procure and easy to handle.

Anthracene Blue C and Formyl Violet 10 B, alone or in combination produce a variety of dark blues of great fastness when dyed upon chrome mordanted wool. The process is to mordant for 1 1/4 hours with

Bichromate of Potash, 3 per cent.
Bisulphate of Soda, 2 1/2 per cent.

lift, rinse well to remove all traces of free chrome, and dye in a fresh bath with the proper quantity of color, assisted with 2 per cent. of acetic acid, commencing at 120 deg. F., gradually increasing to the boil, and boiling for 1 1/2 hours, exhausting the bath by means of from 3 to 5 per cent. acetic acid, added in several portions.

Anthracene Chrome Black which comes on the market in various shades can be dyed in combination with nearly all the dyes previously indicated. The dye liquor is neutralized with oxalate of ammonia and then add

Glauber's Salt, 10 per cent.
Acetic Acid, 5 per cent.

with the proper quantity of dye. Have the bath hot, enter the yarn, raise the temperature rapidly to the boil, and after boiling for 1/2 hour, add 1 per cent. of bisulphate of soda in excess of the weight of the dye used, to ensure exhaustion. Follow this with from 1 1/2 to 2 per cent. of bichromate of potash, and continue the boiling for a further 1/2 hour. Lift, wash well and dry.

A variety of other colors including:

Milling Yellow.
Milling Red.
Wool Red.
Formyl Violet.
Brilliant Milling Green B., etc.,

can be dyed in combination with any of those previously mentioned that are after chromed, thereby producing a very extended variety of mode shades. As a rule, they are mostly dyed from an acetic acid, and Glauber's salt bath, exhausting with either acetic acid or bisulphate of soda.

The process above outlined for cheviot yarns can be easily adapted to piece goods dying, the only point to observe is to make sure that the goods have been thoroughly scoured and rinsed before being entered into the dye bath, otherwise streaks or blotches will surely occur. Such uneven results are generally charged against the dyes as "not dyeing level," but the fact is in nearly every case that hurried scouring has more to do with it than anything else.

Dying with the colors mentioned requires that the process should only progress as rapidly as the wool will take up the color from the bath, and to attempt to force exhaustion of the dye bath at the first part of the dyeing is likely to result in streaks. After the wool has taken up all the color that it will at the boil, and in the presence of the quantity of acid indicated, then it is proper to complete the exhaustion of the remaining color with more acid or bisulphate, but to add either of these before the greater quantity of color is taken up, not only will uneven results obtain, but a consequent loss of color.

After chroming with an excess of chemicals is also improper; sometimes it is thought that a larger quantity of chrome than that directed will make the shades "extra fast." This is not so, the fastness of the color is not dependent upon how much chrome is in the bath, but whether the quantity of color taken up by the wool has in turn been taken up and combined with its saturating equivalent of chrome. Any excess is waste, besides being liable to mar the shade desired.

The proper testing of "fast shades" such as those above referred to, is to prepare a small skein of the dyed and finished yarn, and twist it with a similar skein of undyed yarn, and immerse for 1/2 hour in a hot soap solution, then lift, and mill well in the hands for 10 minutes. There should be no staining of the white yarn, nor should the soap lather be tinted. If the yarn was originally well scoured and rinsed, and well rinsed after dyeing, bleeding into white, or any loss of color due to the soap will not occur.

In the periods of depression many of the Paisley weavers emigrated to the Colonies. A gentleman traveling in Canada stopped at a prosperous looking farm-steading, and finding that the occupant had been a Paisley weaver, asked how he liked his new life. The reply was that he had plenty, but he sadly missed the "crack at the close mouth."—Matthew Blair in "The Paisley Shawl."

BLEACHING INFANTS' WORSTED UNDERWEAR.

BY BETA-NAPHTHOL.

This class of bleaching, or in fact the bleaching of any soft woven or knitted material is not necessarily difficult, but in order to obtain the best results it is quite essential that certain details of manipulation be attended to, in connection with perfect cleanliness on the part of every vessel used in the process, and purity of the chemicals and water used.

See that the entire lot of goods is thoroughly well scoured with a good soap and if necessary assisted with a small quantity of sal soda. Then rinse out thoroughly with warm water. It is a mistake to wash out fine woolen or worsted material by simply passing through cold water. When scouring for peroxide bleaching, it is particularly essential that every trace of soap be washed out of the goods, or else it is likely that the bleach liquor will not act properly.

Where bleaching is done all the time, the scouring ought to be so regulated that there will be no delay in putting the scoured goods immediately into the bleach tank.

The very best results will generally be obtained on worsted underwear if soft soaps be used in scouring, as they leave the goods in a much softer condition, and are easier to wash out

The bleaching is best done with peroxide of hydrogen, because its action on the natural coloring matter of the wool is more energetic, but its action on the fibres is very much less than any other bleaching method, providing due regard is paid to a few simple points.

Peroxide of hydrogen bleaching is carried out in clean wooden vats with the least possible amount of metal exposed, such as iron or other pipes, etc. Each vat should have a false bottom to aid in circulating the liquid, and also have a movable lattice to keep the goods while being bleached below the surface of the liquors.

The water supply should be above question, and it should particularly be free from iron in any form. In nearly every instance of discolored goods coming under observation it can be safely charged against iron in the water used.

The bleaching solution is made by pouring the peroxide of hydrogen into the vat previously filled with the proper quantity of water, and then neutralizing the acid with exactly the proper quantity of silicate of soda. This small quantity of acid is allowed by the manufacturers to remain in the peroxide so that it may be stored a longer time without decomposing or losing its strength. The acid may be also neutralized with ammonia, but silicate imparts a very soft feel to the goods, and on this account is to be desired.

The following proportions for the bleach bath are good and can be safely adopted. They are used today in a number of mills with perfect results. For each 100 pounds of goods, use ten gallons of "twelve volume" peroxide of hydrogen, diluted with sufficient water, so that the entire mass can be kept well covered without any loss of space.

The time of bleaching varies, but for this strength of bath it will be completed in about six hours, when the goods are lifted out and allowed to drain back, rinsed in water containing a trace of sulphuric acid, and finally in clean water. Goods bleached this way ought to be as nearly white as wool can be bleached, and if such is not the case the remedy is to be found in either the water used containing iron as above suggested, or else the bath is acid in reaction, and has not been properly neutralized with alkali, in which case the bleaching action is very feeble. Bleaching can only proceed when the bath has no free acid, and its proper working can be recognized when in a few moments after the immersion of the goods large numbers of minute bubbles of oxygen gas become attached to the fibres, etc. If this evolution of gas is not plainly seen, the operation is defective, and should be at once corrected.

Properly prepared, with pure water, peroxide and chemicals, clean wool in any form can be bleached perfectly and without any defects, either from weakening or from stains and discolorations, which latter can be most likely traced to iron from the water or introduced by other means.

LEVEL SHADES ON MERCERIZED SEWING COTTON.

Complaints occasionally arise from the lack of penetration of color in the finer counts of mercerized cotton threads, and other causes of unevenness, and it is with some difficulty that a solution can be reached that will prevent the recurrence of the trouble in the future.

The great bulk of sewing cotton made at the present time is dyed with the direct colors in a salt bath at a boil, and while many of the dyes of this group cause no trouble, there are others which, owing to their very great affinity for this kind of cotton, go on so quickly that only the outside of the thread is dyed, and the interior is almost white, or at most only stained.

The proper way to dye such yarn is to prepare it by giving it a thorough wetting out with soluble oil at a temperature of 160 deg. F., and then commence the dyeing in a bath treated to 160 deg., but containing only one-third the full quantity of dye, and without salt or Glauber's salt.

Enter the yarn, give three turns, during which time the greater quantity of color will be taken up, and a very level shade secured, then lift and add a further quantity of color, already dissolved. Re-enter the yarn, increase the temperature gradually to 180 deg. F., turning the yarn regularly so that it will take up the color evenly, after which the final third of dye is added, together with from ten to twenty pounds of salt, after which the bath is brought to the boil, so that it will exhaust and thorough penetration be secured.

The details above given are subject to change, according to the depth of color wanted, for instance, light shades can be secured by two portions only, while tints may be obtained by only one addition of color, but in this case it is well to start dyeing cold.

Mercerized cotton has a strong affinity for direct dyes, and it is this that calls for care on the part of the dyer. If a large quantity of dye is placed in the dye bath, and the skeins or warps not moved rapidly enough, uneven and darker colored spaces will result.

The preliminary operation of wetting-out is also important, and should be done thoroughly so that the penetration of the color will be perfect.

For light colors, instead of using common salt or Glauber's salt, phosphate of soda may be used to better advantage.

ON THE USE OF LEAD AND ARSENIC IN DYEING.

These two substances are not used to a very great extent in the dyeing of textiles, but for a few purposes they find employment when other chemicals will not suffice.

Of the two, lead is the most extensively used, and either in the form of the acetate or sugar of lead, or as the nitrate, in either form for the production of chrome yellows in combination with bichromate of potash. The process is well known to all dyers and need not be detailed here.

Sugar of lead is made use of in large quantities in chemical works making a specialty of dyers' chemicals, particularly the acetates of chromium, of aluminium, of copper, of iron, of tin, etc., being used in combination with a sulphate of the metal, double decomposition taking place, with a precipitation of an insoluble sulphate of lead, while a soluble acetate of the other metal remains in solution, and is used after being diluted to the proper strength.

Sugar of lead has also been used to a slight extent in silk weighting, but this process is not extensively followed now, owing to more improved methods. Lead salts of various kinds have also been used in a number of reserve and color discharge processes in cotton printing, but the amount is not great.

It may be safely stated that lead salts as such are very much out of date in the dyeing of textiles, except in the preparation of the chemicals used, which is now more frequently attended to in the chemical works than by the dyer.

The only extent to which arsenic is used in the dyeing industry is as arseniate of soda, and this only to a limited extent in the alizarine process. Owing to the fact that there has always been a positive desire on the part of the dyer and color mixer to get away from the use of chemicals that are poisonous even to a very slight degree, processes employing

arsenical salts, even in small quantities have always been regarded with disfavor, and in few instances only have they ever reached the stage of permanence.

While the use of any of the salts of arsenic in dyeing has been extremely limited, there have been used a number of products employed for various dyeing processes that contained a rather high proportion of arsenic, and there are on record a few cases of arsenical poisoning that have been traced to this source.

In the handling of raw wool, several cases of arsenical poisoning have been observed in woolen mills, and the trouble has been traced to the use of sheep-dips that contained arsenic, the use of which being alike dangerous not only to the animal that has been treated, but also to the man who handles the sheared wool. In sorting such wool, the fine dust that arises carries with it the traces of the poisonous compound with the result that unmistakable symptoms of arsenical poisoning are observed.

Arsenic, as such, is not used, but nearly every chemical used in dyeing, owing to its very nature, always contains a certain small quantity of arsenic in combination. True, this amount of arsenic is very small, but nevertheless it is there, and is capable of doing harm, not only to the dyer and finisher, but to the wearer of the finished fabric. So important has this arsenic matter become, that health boards have given it consideration, and one state (Mass.) has gone to the extreme of regulating the maximum quantities —small though they be—of arsenic that are permitted in fabrics, wall paper, etc., sold in the Commonwealth.

Nearly every chemical used in the manufacture of textiles is obtained directly or indirectly from processes where sulphuric acid is used, and this acid is one of the most important that always contains arsenic, and from which it is difficult to free it. So that it is easily seen that where sulphuric acid is used, there will arsenic be found.

The number of cotton spindles at work on the Continent of Europe in 1903 was estimated at 34,300,000, of which number Germany took the lead with 8,500,000.

TESTING PEROXIDE OF HYDROGEN.

Commercial peroxide of hydrogen often contains oxalic acid and it is frequently necessary to determine the amount. This is done by the following process:

The peroxide is first neutralized with ammonia and then acidified by acetic acid. Calcium chloride is then added. If oxalic acid is present in the peroxide then oxalate of calcium will be deposited. This is collected in a filter, rinsed first in water and then in dilute muriatic acid, dissolved and tested in a standard solution of permanganate of potash.

Many samples of peroxide contain fluorides and as this latter gives a deposit of calcium fluoride with the calcium chloride, it can be exchanged for oxalate of calcium. A high temperature changes the oxalate into carbonate which is dissolved in dilute muriatic acid, accompanied by effervescence and the formation of carbonic acid gas. The calcium fluoride, however, remains unchanged. When oxalate of calcium is heated with a strong sulphuric acid carbonic acid and oxide are given off while the calcium fluoride forms fluorhydric acid, which can be recognized by its odor and corrosive action on glass. Calcium oxalate can be distinguished in the presence of calcium fluoride when permanganate of potash is used in the usual manner, because the fluoride has no effect on the permanganate of potash.—(Translated by the Textile World Record from Leipziger Faerber und Zeugdrucker Zeitung.)

HINTS ON TESTING SIZING MATERIALS.

Starch is detected by the production of a blue color by a drop or two of weak tincture of iodine. The size is next mixed with about three times its volume of alcohol, which throws down metallic salts, gum, and glue. The precipitate is washed with alcohol, and dissolved in distilled water for further examination. The presence of glue will cause this solution to precipitate with tannin. Dextrine and gum arabic are detected by a polarizer. Dextrine rotates a polarized ray to the right, gum arabic rotates it to the left. If both are present the solution in distilled

water is treated with a solution of basic lead acetate, which precipitates gum arabic in the cold, but not dextrine. With heating it throws both down.

If no precipitate has been obtained with alcohol we have probably to deal with agar-agar, tragacanth, or caragheen moss. Sugar is tested for with Fehling's solution before and after converting by boiling with dilute acid. Metallic salts, if present, are tested by the usual analytical processes. Glycerine can be detected in the distilled water solution by boiling it down and heating the residue with acid potassium sulphate, when, if glycerine is present, the characteristic smell of acrolein will be developed. To test for rosin boil the size with caustic soda lye, filter and add an excess of acid to the filtrate, when, if the size contained rosin, a precipitate of sylvic acid will be formed.

If the size contained fats, the same test will give fatty acids floating on the top of the filtrate. If the latter is hot they will look like oil. The amount of fat presented is easily estimated by digesting a weighed quantity of the size with ether, filtering and evaporating down the filtrate, and weighing the fat left. Earthy matters in a size, such as china clay, heavy spar, etc., remain insoluble when the size is boiled with a large quantity of water. —Dyer and Calico Printer.

FAULTS IN WOOLEN GOODS.

There are few manufactured articles which go through so many and various processes as woolen cloth, and this is the reason why there are so many chances of defects in the finished article. The present writer hopes here to deal with some of the defects he has met with in practice, and to assist others in remedying them.

Bleeding of the Dye in Washing.—In a mode worsted the interwoven white mercerized cotton became a pale reddish brown after washing. The weft was a black worsted yarn dyed with Diamond Black PV. To prove that the color came from the weft, mercerized bleached cotton was washed in some more of the same black yarn, and acquired the same reddish brown color shown by the piece. As, however, the dye was marked as fast to milling with white mercerized cotton in the maker's catalogue, it was thought that the fault might lie in the dyeing method. Some worsted was therefore dyed with the Diamond Black according to the maker's recipe, and then milled with white mercerized cotton. No bleeding occurred. Hence the faulty piece had been badly dyed. It had probably been chromed for too short a time, and with too little bichromate. With all one-bath black dyes the bath should always be exhausted down to a very pale red before chroming, which is done at the boil for forty-five minutes. The right proportion between mordant and dye is about 6 per cent. of Diamond, Anthracene Chrome, Alizarine, or Acid Alizarine Black, to 2 1/2 per cent. of bichromate. Imperfect chroming of blacks will always give rise to complaints when mode fabrics are washed.

The following is another case. A worsted vest was sent for examination which, when worn in the summer months, became quite changed in color under the armpits. The material was dyed with an adjective dye. Tests showed that when some of the black yarn was mixed with bleached cotton it did not bleed on washing, or when acted on by perspiration. Hence the fault could not be with the black yarn. When a piece was cut from the altered part of the vest and boiled in water, the liquid became dark blue, and proved to be a solution of a direct black cotton dye, such as those universally used for linings. This shows that the cause of the bleeding was the want of fastness to perspiration of the cotton black in the lining.

Black Marks on Colored Goods.—A red cloth sent for examination showed black marks of various sizes. It had been dyed in one bath with Lanafuchsine, Glauber's salt, and sulphuric acid. The black marks did not appear in the white piece, but only after the dyeing. The microscope showed that at the black places the threads were adhering to lumps of dirt and grease. They had been produced by the lubricant used in the machinery of the dye-house, or at some later stage. The best way to remove such stains is to soak them well with Oleine, and then, after some standing, to wash the piece with soap in a washing machine, rinse thoroughly,

and boil in the old dye bath for half an hour.

Rust Stains.—These are often caused through bits of the teeth of the cards getting entangled in the fabric, where they rust and become surrounded by a yellow stain. To remove these stains proceed as follows: Make a 5 per cent. solution of oxalic acid in a clean wooden vat. Enter the cloth into this at a temperature of about 140° F., and work for half an hour, gradually raising the temperature meanwhile to the boil. Then lift, and rinse thoroughly. The boiling is necessary to enable the acid to get at the innermost parts of the stain.

Damp (Mould) Stains.—A piece of cloth, which had been dyed dark blue in the woad vat, showed pale marks, which the microscope proved to be due to mould. This had destroyed the fibre, many of the cells lying loose in the fabric. If this has gone far the piece goes into holes at the mouldy places on washing. Such stains can obviously not be removed. Dyed pieces, especially from a fermentation vat, should not be allowed to lie about wet. A single night will effect the mischief. The more alkaline the vat the greater the danger of mould, so that the hydrosulphite vat being less alkaline than the fermentation vat, is the safer of the two. Warmth also favors mould, so that the goods should be rinsed and cooled at once. If, however, the goods must of necessity lie wet, they should first be passed through very dilute sulphuric acid.

Dark Marks on Piece Dyed Goods.—Two pieces of cloth both showed, after dyeing and drying, irregularly-shaped black marks of various sizes appearing on both sides of the piece. The microscope showed that these places had taken up more dye than the rest, and that the fibre there was seriously damaged and broken up. The cause was that strong soda had been splashed over the piece before dyeing, soda being, of course, used to remove the spinning oil. Such stains cannot be removed. To take out the spinning oil the carbonate of soda, or caustic soda, should never exceed 6° B in strength, and in many cases soap alone should be used. The solution must in no case be too hot. Strong hot soda increases the affinity of the fibre for lye wherever it may touch it, and tenders it besides. Fuller's earth and urine make an excellent combination for removing spinning oil, and are free from the dangers just alluded to. Whatever is used, a thorough rinsing afterwards is, of course, indispensable.

It often happens that the borders of a piece are the darkest, the color getting gradually paler as we recede from them, or vice versa. This shows that the goods were not properly rinsed after cleaning, and that they have been hung up so that soap residues have accumulated in those parts which happened to be lowest. Under such circumstances level dyeing is an impossibility. The remedy is obvious.—Berlin Faerber Zeitung.

CREPON EFFECTS.

BY FRANK J. FARRELL, M. Sc.
(In Journal of the Society of Dyers and Colorists.)

Methods for the production of crepon effects on woven fabrics may be roughly divided into three classes:—

1. Weaving Methods.—Under this heading I class methods depending upon different degrees of spin or twist on different threads in the fabric. Highly spun threads contract very considerably when wetted in the bleaching or dyeing operations. A fabric consisting of alternate stripes of threads of high spin and threads of little or no spin for the warp, and threads of little or no spin for the weft produces a striped crepon effect when wetted. Effects of this description in stripes or fancy designs are frequently produced in all silk fabrics and in wool and silk and wool and mohair mixtures. In mixtures the uncontracted portion—that is, the portion thrown into prominence—is always the more expensive fibre. For example, in silk and woolen crepons the wool is always the contracting fibre, the more expensive and more effective silk fibre being rendered more prominently in the resulting fabric.

2. Mechanical Methods.—Crepon effects are frequently produced by embossing the fabric with engraved rollers, the best example of this class being mourning crape. Fancy crepon effects are produced in a similar manner.

3. Chemical Methods.—The production

of crepon effects by chemical means is based on the fact that certain fibres, when treated with certain chemical solutions, contract very considerably in length. The methods employed in the production of crepon effects by chemical means may be divided into two classes:

(a) When the fabric is woven from two fibres only, one of which is acted upon by a specific solution. For example, cotton contracts in length when treated with a solution of caustic soda having a density of 70° Tw. The silk fibre when treated with the same solution does not contract. (Silk dissolves completely in caustic soda if left for too long a period.) In employing this method silk which has not been de-gummed should be employed, as the sericin reduces the deteriorating action of the caustic soda very considerably.) A fabric is woven with the warp consisting of alternate stripes of cotton and of gum silk, and the weft consisting of gum silk. On immersion in the caustic soda solution the cotton contracts, while the silk is unaltered, with the exception that its covering of sericin has been removed by the caustic soda.

(b) When the fabric is woven from one fibre only a crepon effect may be produced by the local action of the contracting solution. This method is largely employed in the production of crepon effects on all cotton fabrics, the local action of the caustic soda solution being obtained either by printing on the caustic soda in a stripe or other pattern, or by printing the fabric with a gum or other resist and then immersing in the caustic soda solution. In the former the printed portion contracts, and in the latter the unprinted portion, the gum resist effectively protecting the printed portion.

Up to the present it has not been possible to obtain an analogous effect on all silk fabrics, as no solution was known to produce the necessary contraction of the fibre. The experiments which I made in order to discover whether this effect could be produced in silk fabrics were made about seven years ago, but owing to pressure of other work I allowed the matter to remain in abeyance, and did not publish my results.

By experiments with hydrochloric acid at all densities I found there was one point, viz., from 1.145 to 1.147 sp. grv. (29° Tw. to 29.5° Tw.) where the silk gradually contracted by about one-third without any appreciable deterioration in the strength of the fibre. With solutions below 29° Tw. no contraction whatever takes place; with solutions above 30° Tw. complete disintegration of the fabric occurs. This method may be applied to the production of crepon effects. The fabric is printed with a resist—preferably a wax resist—and is then immersed in the hydrochloric acid. The contraction is complete in from one to two minutes, when the fabric is well washed in water.

Before removing the wax resist by washing in hot water the fabric may be dyed, in which case white crepon effects are produced on a colored ground. The reverse effects may be obtained by printing the silk with a colored gum resist (employing colors not affected by hydrochloric acid) and immersing in hydrochloric acid. After the removal of the gum by washing, there remains a colored crepon effect on a white ground. I have obtained the best results with a bright thin fabric, such as chiffon brilliante; the contracted portions lose their brilliancy and have a crepe de chine appearance. The contrast between this and the unaltered brilliancy of the uncontracted portion produces a very pleasant effect.

The crepon silk was dyed with cold basic dyes, as a high temperature was liable to remove the wax. I have tried sulphuric, phosphoric, acetic and formic acids of various strengths with no effect. No microscopical examination of the contracted silk was made, but the patterns which were produced seven or eight years since, and which are in a state of good preservation, show that little, if any, tendering of the fibres has taken place when using hydrochloric acid for the production of the crepon effect.

New Color Cards.

Sulfur Yellow R Extra: Berlin Aniline Works, 213 Water St., New York City.

Two samples of cotton yarn and two of cotton piece goods showing 6 per cent. dyeings of Sulfur Yellow R Extra, in standing bath, direct dyeing and after-treated dyeing.

Wool Fast Blue B L; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Three samples of wool piece goods dyed with different percentages of Wool Fast Blue B L. One of the samples has white cotton striping threads not colored by the dye.

Sulfon Yellow; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Two samples of woolen yarn showing 1 per cent. dyeings of Sulphon Yellow R and 5 G.

Katigen Blue Black G; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Two samples of cotton yarn showing 16 per cent. dyeings of Katigen Blue Black G.

Thiazole Yellow 3 G; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

Two samples of cotton yarn and one of printed piece goods dyed with Thiazole Yellow 3 G.

Rhoduline Yellow 6 G; Farbenfabriken of Elberfeld Co., 40 Stone St., New York City.

One sample of cotton yarn and one of cotton piece goods dyed with Rhoduline Yellow 6 G, and two samples of piece goods printed and one discharged with the same color.

Dyeings on Half Wool Linings; Cassella Color Co., 182 Front St., New York City.

Forty samples of mohair serges and Italians showing a great variety of shades. Some of the samples are cross dyed with the Anthracene Chrome colors; some show white striping threads not colored by the dye.

DYE RECIPES.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation Subscription price for the Dyers' Supplement $1.00 per year

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Recipe No. 49.

Green on Cotton Yarn.

Sulphur Green G on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Sulphur Green G (standing bath).
(Berlin Aniline Works, 213 Water St., New York.)
12 lbs. Sodium Sulphide Crystals.
10 lbs. Soda Ash.
30 lbs. Glauber's Salt.

First boil up the bath with the soda and add the dyestuff previously dissolved with the sodium sulphide in boiling water. Then add the Glauber's salt and dye for one hour at about 200° F.

When dyeing is completed rinse immediately, wring and dry. An after treatment is not as a rule necessary.

Sulphur Green G yields dyeings of considerable brightness for a sulphur green and possesses good fastness.

Recipe No. 50.

Red on Worsted Yarn.

Cloth Red 5 B on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Cloth Red 5 B.
(American Dyewood Co., 156 William St., New York.)
5 lbs. Acetic Acid.

Enter yarn into the cold bath, bring to a boil and dye at a boil for thirty minutes, then add

2 lbs. Sulphuric Acid

to exhaust the dye bath. Boil twenty minutes more, or long enough to exhaust the dye bath, then add

1½ lbs. Potassium Bichromate

and boil twenty minutes longer.

Cloth Red 5 B possesses excellent fastness to light and fulling.

Recipe No. 51.

Blue on Cotton Yarn.

Chlorantine Pure Blue on 100 lbs. bleached cotton yarn. Prepare the dye bath with

½ lb. Chlorantine Pure Blue.
(A. Klipstein & Co., 122 Pearl St., New York.)
20 lbs. Common Salt.

Enter yarn at 180° F. and dye at the boil for one hour.

Chlorantine Pure Blue is exceptionally fast to chlorine and 15 minutes' immersion in 2° Tw. bleaching powder solution scarcely alters the original shade.

Recipe No. 52.

Brown on Cotton Yarn.

Tetrazo Brown 3 Y on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Tetrazo Brown 3 Y.
(American Dyewood Co., 156 William St., New York.)
30 lbs. Common Salt.

Enter at 180° F. and dye at a boil for one hour.

Tetrazo Brown 3 Y dyes very level and is thus well adapted for combination shades as well as for a self color. It is particularly useful for the production of tans, etc., for hosiery.

Recipe No. 53.

Violet on Cotton Yarn.

Chlorantine Violet R on 100 lbs. bleached cotton yarn. Prepare the dye bath with

½ lb. Chlorantine Violet R.
(A. Klipstein & Co., 122 Pearl St., New York.)

20 lbs. Common Salt.

Enter at 180° F. and dye at the boil for one hour.

Chlorantine Violet R is exceptionally fast to chlorine and 15 minutes' immersion in a 2° Tw. solution of bleaching powder scarcely alters the original shade.

Recipe No. 54.

Yellow on Worsted Yarn.

Alizarine Yellow G on 100 lbs. worsted yarn. First mordant the yarn in a bath made up with

3 lbs. Potassium Bichromate.
2 lbs. Tartar,

and then dye in a bath containing

2 lbs. Alizarine Yellow G.
(Edwin M. Thayer & Co., 112 Broad St., Boston.)

and

4 lbs. Saccharic or Lactic Acid.

Enter yarn cold, bring to a boil and dye at a boil for one hour.

Alizarine Yellow G is an exceedingly fast color. It works well with all other alizarine colors, and on account of its level dyeing properties is particularly useful in combining with them.

Recipe No. 55.

Black on Cotton Yarn.

Sulphur Black T G Extra on 100 lbs. cotton yarn. Prepare dye baths as follows:

First Bath.

10 lbs. Sulphur Black T G Extra.
(Berlin Aniline Works, 213 Water St., New York.)
30 lbs. Sodium Sulphide.
25 lbs. Sal Soda.
2 lbs. Caustic Soda (Solid).
100 lbs. Common Salt.

Second Bath.

7.5 lbs. Sulphur Black T G Extra.
(Berlin Aniline Works, 213 Water St., New York.)
15 lbs. Sodium Sulphide.
15 lbs. Sal Soda.
6.5 oz. Caustic Soda (Solid).
20 lbs. Common Salt.

Third and Standing Bath.

6 lbs. Sulphur Black T G Extra.
(Berlin Aniline Works, 213 Water St., New York.)
13 lbs. Sodium Sulphide.
6 lbs. Sal Soda.
6.5 oz. Caustic Soda (Solid).
Common Salt, enough to make bath 8° Tw.

Enter cotton well opened and keep below the surface of the liquor.

Dye one hour just below the boil, then raise, allow cotton to drain well, and rinse in running water until it comes perfectly clear.

Sulphur Black T G Extra possesses excellent fastness to light, washing and acids.

Recipe No. 56.

Blue on Worsted Yarn.

Xylene Blue A S Pat. on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Xylene Blue A S Pat.
(Walter F. Sykes & Co., 85 Water St., New York.)
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter at a boil and dye at a boiling temperature for three-quarters of an hour.

Xylene Blue A S Pat. represents a new type of the Xylene Blues, and its dyeings show very good fastness to washing, light and fulling. It dyes level at a high temperature, combines well with other acid colors, and possesses remarkable brightness.

Recipe No. 57.

Blue on Worsted Yarn.

Milling Blue 2 R on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Milling Blue 2 R.
(H. A. Metz & Co., 122 Hudson St., New York.)
20 lbs. Glauber's Salt.
4 lbs. Sulphuric Acid.

Enter yarn at 120° F. and dye at a boil for one hour.

To increase the fastness either 5 to 10 lbs. of ordinary alum, 5 to 10 lbs. of chrome alum, or 2 to 4 lbs. of chromium fluoride may be added just before the dyeing is finished.

Milling Blue 2 R is recommended for use where very bright shades of blue and moderate fastness to fulling are required.

Recipe No. 58.

Dark Purple on Cotton Yarn.

Thionol Dark Purple on 100 lbs. cotton yarn. Prepare the dye bath with

6 lbs. Thionol Dark Purple.
(Thos. Leyland & Co., 53 India St., Boston.)
12 lbs Sodium Sulphide.
1 lb. Soda Ash.

Dissolve the above in the bath, which should contain about 200 gallons of water. Boil up the bath until solution is complete, then add

50 lbs. Common Salt.

Dye one hour just below the boil, rinse and wring quickly, then dry.

Thionol Dark Purple is a very concentrated sulphur color, possessing the characteristic fastness of the other sulphur colors. The violet black

shade exhibited which it produces as a self color is not so interesting as the compound slates, drabs and dark browns that it produces with the other Thionol colors.

Recipe No. 59.

Yellow on Worsted Yarn.

Fast Light Yellow 2 G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Fast Light Yellow 2 G.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
10 lbs. Glauber's Salt (Crystals).
5 lbs. Sulphuric Acid.

Enter at 180° to 190° F. and dye at a boil for one hour.

Fast Light Yellow 2 G is excellently fast to light, and is useful for a combination color. It is very valuable where fastness to light is of greater importance than fastness to washing.

Recipe No. 60.

Green on Worsted Yarn.

Wool Green S W on 100 lbs. worsted yarn. Prepare the dye bath with

1 lb. Wool Green S W.
(Edwin M. Thayer & Co., 112 Broad St., Boston.)
10 lbs. Glauber's Salt.
2 lbs. Sulphuric Acid.

Enter yarn at 110° F., bring to a boil and dye at a boil for one hour.

Wool Green S W besides being very valuable as a self color is particularly useful in the production of compound shades. It dyes level and may be used upon a chrome mordant.

Recipe No. 61.

Black on Worsted Yarn.

Diamond Black P 2 B on 100 lbs. worsted yarn. Prepare the dye bath with

7 lbs. Diamond Black P 2 B.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
2½ lbs. Acetic Acid.

Enter the yarn just under the boil, bring to the boil and boil for 20 minutes, then add

2½ lbs. Sulphuric Acid,

boil for another 20 minutes, and allow to run for ½ hour without steam.

Then after-treat for 35 to 40 minutes at the boil with

2½ lbs. Potassium Bichromate.

When the dyeing is done in a copper vessel it is advisable to add some sulpho cyanide of ammonia.

Diamond Black P 2 B is very easily soluble, and dyes excellent bluish blacks, which in very dark tones closely approach that of logwood.

It possesses excellent fastness to light and milling, stoving, carbonizing, potting, washing, perspiration and cross-dyeing.

Recipe No. 62.

Violet on Worsted Yarn.

Acid Violet 5 B S (Conc.) on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Acid Violet 5 B S (Conc.).
(American Dyewood Co., 156 William St., New York.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 170° F. and dye at a boil for one hour.

Acid Violet 5 B S (Conc.) is readily soluble and possesses good fastness to fulling. It should be of interest for union dyeing as well as for straight wool dyeing.

Recipe No. 63.

Greenish Blue on Worsted Yarn.

Tetra Cyanole S F on 100 lbs. worsted yarn. Prepare the dye bath with

2 lbs. Tetra Cyanole S F.
(Cassella Color Co., 182 Front St., New York.)
4 lbs. Sulphuric Acid.
15 lbs. Glauber's Salt.

Enter at 180° F. and dye at a boil for one hour.

Tetra Cyanole S F possesses level dyeing properties and gives an excellent shade of greenish blue.

Recipe No. 64.

Black on Cotton Yarn.

Colonial Black on 100 lbs. cotton yarn. Prepare the dye bath with

5 lbs. Colonial Black.
(F. E. Atteaux & Co., 174 Purchase St., Boston.)
20 lbs. Common Salt.

Enter the yarn at 170° F., bring to a boil and dye at a boiling temperature for one hour.

Colonial Black is an excellent color for all cotton and cotton and wool union goods. It possesses good fastness to light and washing. On union goods the 20 lbs. of common salt should be replaced with 10 lbs. of common salt and 10 lbs. of Glauber's salt.

In the old days two or three weeks' time was required to set up a loom for weaving an expensive plaid. The weaver bore the cost of this, but was aided by the men and boys who worked with him who received as a reward a feast of bread and cheese.

Mill News.

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the Textile Advance News, issued weekly by the publishers of the Textile World Record, at $15.00 per year.

COTTON.

New Mills.

*Georgia, Cartersville. The American Textile Company has started their mill with 26,000 spindles and 580 looms, making light weight sheetings and drills up to 40 inches. A dye plant will be put in. The picker building, engine room and stack have been built large enough for an additional mill of equal size. They will add 4,000 spindles and about 100 looms by August 1st. It is proposed to build the second end of the mill and equip it some time within the coming year. W. M. McCafferty is manager of the plant and J. W. Brown, superintendent.

*Massachusetts, Fall River. The Anawan Mill property is being torn down and it is stated that another new mill for the Fall River Iron Works will be built on the site.

*Mississippi, Meridian, The new cotton mill project previously reported will be known as the Beatrice Cotton Mills. Louis Cohn, formerly manager of the Meridian Cotton Mills, will be the vice-president and general manager; W. G. Meyer, treasurer, and M. Winner, president. It has been incorporated with a capital stock of $400,000. A new building will be erected, and they report that they expect to begin work on same about May 1st, They will make 30s yarn and fancy colored weaves. 20,000 spindles and 600 looms. None of the equipment has been bought. This project was based on the offer of out-of-town parties to furnish $250,000 capital, provided local capitalists invest $150,000.

*North Carolina, Albemarle. The new building to be erected for the Wiscasset Mills Co., and which will be known at Mill No. 3, will be 175 by 125 feet, two stories high. They will install about 20,000 spindles.

*North Carolina, Burlington. The Hopedale Cotton Mill Company has been incorporated and will operate mill formerly known as the Juanita Cotton Mills. James N. Williamson, Jr., Lynn B. Williamson and Gen. Julian S. Carr, the latter of Durham, are interested.

North Carolina, Concord. Site has been chosen and work will start at once on erection of a 10,000 spindle mill to be erected by new company in which R. A. Brown, Chas. W. Johnson (Charlotte) and E. F. White (Concord) are interested.

*Rhode Island, Washington. The twine mill to be started here by Messrs. Davis and Rathbun will be operated under name of the Rathbun & Davis Twine Company.

Enlargements and Improvements.

Alabama, Anniston. An additional building, 100 by 50 feet, one story, brick, is to be erected for the Woodstock Cotton Mill and capacity of the plant doubled.

*Connecticut, Windsor Locks. The new building for the J. R. Montgomery Co. has been completed. New machinery is being installed.

Georgia, Columbus. The Bibb Manufacturing Company has placed orders for 4,000 mule spindles and two pairs jack frames for making softer yarns than hertofore.

Georgia, Columbus. Additional machinery has been ordered for installation in the carding department of the Georgia Manufacturing Co.'s plant.

Georgia, Dalton. The Crown Cotton Mills are replacing eighty-four old Crompton looms with sixty-eight 50-inch ones from the Lowell Machine Shop.

Georgia, Moultrie. At meeting held recently by the directors of the Moultrie Cotton Mill, it was decided to double the present capacity. They now have 5,000 spindles which will be increased to 10,000 and other machinery likewise. Work is under way on enlarging present buildings and machinery ordered.

*Georgia, Palmetto. The Palmetto Cotton Mills will install 100 new looms in the new addition (75 by 125 feet) reported to be built to the plant.

Georgia, Quitman. The Atlantic & Gulf Mills have placed contracts for additional roving frames, revolving flat top cards and other machinery to be installed.

Massachusetts, Adams. Contract has been let for erection of an addition 125 by 50 feet, to the main mill of the Adams Bros. Manufacturing Co.

Massachusetts, Clinton. The Lancaster Mills are to install, shortly, 360 new Draper looms, to replace same number of old-fashioned ones now in the plant.

Massachusetts, Ware. The Otis Company has let contract for erection of a brick building, 125 by 80 feet, 3 stories, for cotton storehouse. Work will start as soon as weather permits.

New York, Patchogue. Work will start at once on erection of another addition, 170 by 80 feet, three stories, brick, to the Patchogue Manufacturing Co.'s plant. The new building will be used for the Irish point curtain department.

North Carolina, Charlotte. The Highland Park Manufacturing Co. is to install 15,000 additional spindles (ordered) in the mill.

*North Carolina, Cumberland. Messrs. J. Frederic Houston & Co., 704 Provident Bldg., 4th and Chestnut Streets, Philadelphia, who bought out and took over the business of the Cumberland Cotton Mills Co. about seven months ago, states that the mill is now running full time with plenty of orders on hand for their production consisting of cotton warps, skeins, tubes or cones, 8's to 16's, single and two-ply, which they turn out on 2,736 spindles. Mr. Houston also announces that the capacity of

the mill is to be doubled in a very short time. J. B. Driver is the superintendent.

North Carolina, Elon College. The Ossipee Cotton Mills, of which Jos. Hammill is superintendent, have replaced 24 old looms with 24 new ones.

North Carolina, Henderson. The Henderson and Harriet Cotton Mills are to install additional machinery, including spindles, in the mills.

North Carolina, Lowell. The Spencer Mountain Cotton Mills are to make extensive improvements to the plant. A new dam is to be constructed for furnishing 1,000 h. p. to be used in generating electricity for operating the plant. It is also probable that other enlargements and improvements will be made, but upon this nothing has yet been definitely settled.

Pennsylvania, Chester. The Jordan Manufacturing Co., now operating 576 looms on fine cotton and silk fabrics which they bleach, dye and finish, it is reported will materially enlarge their plant by building a new weave shed in which they will put 300 more looms. The company has a capital of $300,000 and Robert F. Kineavy is the superintendent. The goods are sold direct through their New York office.

Pennsylvania, Philadelphia. Joseph J. Scheiter & Co. will remove their plant to the first floor of the mill formerly occupied by the Corcoran Ingrain Carpet Mills, Howard and Lehigh Avenues. They will add 20 new haircloth looms and 10 70-in. looms to present equipment. Operations are expected to commence about the first of April in new location.

Pennsylvania, Philadelphia. J. Turner, who started a plant for the manufacture of hair cloth about two years ago at 1414 North 9th Street, with 10 looms and then removed to Howard and Palmer Streets, where he increased his capacity by adding 20 more looms, is again about to remove to new and enlarged quarters at Howard and Lehigh Avenue, where he will again double his equipment. The production is sold direct. John Mair is superintendent of the plant.

Pennsylvania, Philadelphia. The Krout and Fite Manufacturing Co., now located on Emerald Street, below Allegheny Avenue, are about to have erected for their use a new mill building of the slow-burning construction plan, which will be equipped with a sprinkler system and an electric power plant, at Wayne and Roberts Avenues, Wayne Junction. The contract has been let to William Steele & Sons, who are now taking estimates for the work, which will consist of a five-story and basement main building, 189.2 5/8 by 55 feet, with a one-story wing, 160 by 55 feet; a one-story office, 45 feet square, and one-story boiler and engine house, 32 by 81 feet. This company manufactures bindings and narrow fabrics, which they bleach and finish and sell direct. The cost of new addition will be about $100,000. All bids are due on April 1st.

*South Carolina, Easley. The Easley Cotton Mills will build an addition 71 by 128 feet and one 30 by 50 feet, to their plant and when completed will install 6,000 new spindles and 200 looms. This will give them a total of 38,032 ring spindles and 1,000 (Draper) looms, making export goods. It is expected to have the new addition completed by May 15th.

*South Carolina, Hartsville. The Hartsville Cotton Mills, reported putting in 5,000 additional spindles, are also adding 100 looms.

*Tennessee, Chattanooga. The Bowen-Jewell Co. will manufacture all kinds of cotton bags at mill here. They will continue running the mill at Jewell's, using the goods at the new plant.

Mills Starting Up.

Alabama, Huntsville. The West Huntsville Cotton Mills have been put in operation and are running on 2s to 14s single and plied yarns. This plant is equipped with 6,000 spindles. T. W. Pratt is president of the company, R. A. Pratt, treasurer and E. A. French, superintendent.

*Georgia, Atlanta. It is reported that the Atlanta Cotton Mills, which have been closed for about two years, are to be put into operation shortly.

*South Carolina, Camden. Operations have been resumed in the Camden Cotton Mills, recently sold to parties who have re-organized the plant as the Hermitage Cotton Mills. H. G. Garrison is interested in the new company.

Mills Shutting Down.

*Connecticut, East Hampton. Work has started removing the machinery in the Star Net & Twine Company's plant to Baltimore.

Mississippi, Magnolia. The Mississippi Textile Novelty Company is to go into voluntary liquidation.

New Hampshire, Ashland. The webbing plant started here the latter part of last year by Donald Buchan has been sold. Mr. Buchan has accepted a position with the Atlas Linen Co., Meredith.

Pennsylvania, Philadelphia. Hoyle, Harrison & Kaye, manufacturers of tapestry and upholstery goods, Lehigh Ave. and Rosehill St., are going out of business and selling out the machinery.

WOOLEN.

New Mills.

California, San Francisco. W. F. B. Gunther has severed his connection with the Golden Gate Woolen Mills, and is starting in the rug business. He will make Ottoman rugs, and the concern will be known as the Golden Gate Rug Manufacturing Co., located at 844 Bay St.

*Connecticut, Killingly. A new mill will be erected for the Interstate Company, recently incorporated to manufacture shoddy. The building will be 150 by 50 feet, two stories high, and will be lighted by electricity, which will probably be generated by a private plant.

Maine, Guilford. The M. L. Hussey Woolen Co. has been incorporated and will erect a new woolen mill at this place. A four-set plant is proposed. C. D. Shaw, M. L. Hussey and F. B. Pease (Guil-

ford), and A. C. Houston (Sangerville) are interested.

*Massachusetts, Concord. The Concord Mills have been incorporated with capital stock of $160,000. Edward P. Chapin is president of the company and R. T. Robinson, treasurer.

*Massachusetts, West Millbury. Albert Crenshaw is president of the Arkonia Fabric Mfg. Co., recently incorporated with capital stock of $25,000, to operate the weaving, dyeing and finishing departments of the Hoyle Mills. Joseph C. Sullivan is treasurer. They manufacture men's wear, operating 18 broad and one narrow loom, using steam and water power. Goods are sold direct.

*Missouri, Kansas City. The Hershberger McAfee Woolen Mill Co. expects to start operations about June in their new mill, making cassimeres, which will be cut and made into suits, pants and skirts. This company is capitalized at $150,000, with W. E. Hershberger, president; A. C. Casteel, treasurer and J. F. McAfee, manager; plant will be equipped with 4 sets cards, 20 broad looms, dye house, and operated by steam. Will sell goods direct.

New Jersey, Paterson. The New Jersey Shawl Company is operating a plant at 93 River Street, making men's wear and woolen and worsted shawls. Plant is equipped with 9 looms and operated by steam.

New Jersey, Richland. Thomas B. Evans is about to start up a plant here for the manufacture of patent fire-proof rugs. Two hand looms have been ordered and will be delivered within a few days and an order has been placed for six more.

*New Jersey, Somerville. The machinery formerly operated by the Clifton Mills Co., Philadelphia, Pa., consisting of 55 broad looms which were run on men's wear, worsted suitings, is being removed to this place, where they will again be started up by the new Laurel Mfg. Co., with which Wink Bros., the old proprietors of the Clifton Mills Co. will be connected, Fred. Wink as the superintendent and Charles Wink as buyer. The new concern, which expects to start up about April 1st, will manufacture men's wear and dress goods, which is to be sold through a New York commission house.

Pennsylvania, Philadelphia. The Delmar Carpet Mill has recently been started at 145 Oxford street, where rugs from old carpets are being made. This mill is owned and operated by the Sanitary Mfg. Co., which manufactures carpets and art squares on 10 looms in the same building.

Pennsylvania, Philadelphia. The Empire Cloth Manufacturing Co. is the name of a new concern about to start operations in the Empire Mills, Kensington Avenue and Huntingdon St. The second floor of this building has been leased in which they will put 10 new broad Crompton and Knowles looms and preparatory machinery for the manufacture of rain cloths and men's and women's wear, using 20's to 50's and 30/2 to 60/2 yarns, the product being sold direct. This new mill will be run under the management of William Barras, until recently in charge at the Unity Woolen and Worsted Mills, Frankford, a mill which is run on foreign capital and is meeting with much success.

*Pennsylvania, Philadelphia. Messrs. Wright, Hall & Co., a new concern which recently started up in the manufacture of cotton worsteds and dress goods on 57 narrow looms at Howard and Jefferson Sts., report that their company has been incorporated under the name of the Wright & Hall Textile Co., with Loring C. Hall as president and John Wright, treasurer. They buy numbers 2/20 and 2/30 cotton yarns. Mr. L. C. Hall is the buyer. The goods are sold direct.

Pennsylvania, Philadelphia. Messrs. Riggs, Worthington and Simonds, until Monday, March 27th, employed by Benjamin W. Greer, well known as a manufacturer of worsted and cotton goods, are about to start up a plant for the manufacture of dress goods in the Charter Hosiery Mills, Ashmead and Wakefield Streets, Germantown, where they have taken the third floor, formerly occupied by the late Iroquois Knitting Co. They will install between 20 and 40 looms. It is not known whether the goods will be sold direct or through agents.

*Pennsylvania, Philadelphia. Operations have been started in the Abbott Manufacturing Company's new plant at 2630 Mascher Street on fancy worsteds and dress goods.

*Rhode Island, Burrillville. J. A. King is president of the Clear River Mills, recently incorporated with capital stock of $100,000; C. F. Potter, treasurer, and O. T. Inman, superintendent. Work is well under way on the new mill which they propose having ready to start operations May, 1905, making twist yarns and men's wear cloth. Plant will be equipped with 46 looms and dye house and operated by water and steam power. Will sell yarns direct.

*Rhode Island, Hope Valley. Messrs. Youngman & Hammond, recently reported as having purchased the Locustville Mill, will start operations about August 15th, manufacturing overcoatings, cloakings, shirtings and fancy cassimeres. The plant will be equipped with 2 sets cards and 32 looms and equipped with dye house. They have paid in capital of $30,000. G. M. Youngman is superintendent and buyer for the mill.

*Rhode Island, Woonsocket. The Woonsocket Spinning Company will start operations April 3rd, manufacturing woolen and cotton yarn from 1 to 60. Joseph Rogister is president of the company capitalized at $12,000, and Albert Tamboise, treasurer. D. Servais and Joseph Rogister will be superintendent of the plant, equipped with 3 sets cards. They will sell product direct.

Enlargements and Improvements.

Connecticut, Meriden. Twenty new looms have recently been installed in the Meriden Woolen Co.'s plant.

*Illinois, Lacon. John Grieve's Sons have installed 2 sets 40 inch cards and 6 new looms in the mill, giving them a total of 4 sets cards and 20 looms.

Kentucky, Louisville. The Falls City Woolen Mills have recently installed two additional sets of cards in the plant, giving them a total of 13 sets.

*Maine, Readfield. Ten looms are now in operattion in the Readfield Woolen Mills, recently pur-

chased by the Chase Mfg. Co., of Waterville. The company proposes building an addition, 55 by 25 feet, three stories, during the summer, and putting in a new water wheel.

Maine, Springvale. Work will start about April 1st on erection of an addition, two stories, for the Maine Alpaca Co. When completed, they will install 48 new English looms and 10 spinning frames.

Massachusetts, Auburn. Two additions, each 250 by 60 feet, one story high, will be built for the Ettrick Mills.

*Massachusetts, Cherry Valley. An addition, 120 by 60 feet, three stories, is to be built to the Bottomly Mill of the Chapel Mills Mfg. Co. A new power house, in which two 125 h. p. boilers will be installed will also be erected. New machinery, including cards and jacks, and 24 looms, will be installed. It is expected to have the new addition in operation August 1st. It was previously reported that the Valley Woolen Mill would be enlarged, but it should have read the Bottomly Mill.

Massachusetts, Franklin. A new addition, 20 by 40 feet, one story, will be built for the spooling and dressing departments at the American Woolen Company's mill.

*Massachusetts, Lowell. The new mill for the Bigelow Carpet Company will be about 225 feet by 60 feet, seven stories, of heavy mill construction. It will be used for yarn and carding departments.

*Massachusetts, North Andover. We have been advised by the Brightwood Manufacturing Company that they are contemplating an auxiliary plant for fifty looms near by, and have two or three properties under consideration, but have not yet decided where they will locate.

Massachusetts, North Chelmsford. A new dye house is under construction for the Moore Spinning Co.

Massachusetts, Pittsfield. The Pontoosuc Woolen Company is to install several new looms in the plant.

Massachusetts, Pittsfield. Plans are under way for extensive improvements to be made to the Helliwell Manufacturing Company's plant. A large addition is to be built to the main building and special carding and spinning machinery installed. New boilers and a new engine will also be put in.

Massachusetts, Watertown. Plans have been prepared by the Aetna Mills for an addition 112 by 27 feet, one story to the dye house, 25 by 75 feet, two stories to the finishing mill and one 50 by 100 feet, five stories, to the weaving mill.

*Michigan, Yale. As soon as weather permits, work will start this spring on an addition to the Yale Woolen Mills, recently incorporated, with capital stock of $100,000 and succeeding C. Andreae & Sons. They will install 2 new sets of cards, 1,248 spindles and 11 looms.

New York, Binghamton. The Binghamton Fabric Printing Co.'s plant has been purchased by the Faatz-Reynolds Felting Co., of Lestershire. The company proposes using the new printing process in the manufacture of felt goods for hats and millinery purposes. The plant will be continued here for the present, but later an addition will be built at Lestershire for the department.

Oregon, Pendleton. The Pendleton Woolen Mills have added manufacture of rugs to the plant.

Pennsylvania, Cardington. Wolfenden, Shore & Co. have incorporated with capital stock of $300,000. John Wolfenden is president of the company; W. L. Shore, treasurer, and John T. Wolfenden, secretary.

Pennsylvania, Clifton Heights. Work has started on extensive alterations to the Thomas Kent Mfg. Co.'s plant. The dye house is to be enlarged and additional looms installed in the weave room.

Pennsylvania, Ebensburg. Extensive repairs are being made to the Ebensburg Woolen Mills.

*Pennsylvania, Norristown. The Coral Manufacturing Co., which recently completed erection of a two-story brick addition, has equipped the first floor with looms and installed the beaming department in the second. They are now erecting a building, 70 by 23 feet, for a dye house, and will equip same with modern machinery.

*Pennsylvania, Philadelphia. John W. Harmer is the president and John Foyce the treasurer of the Hall Yarn & Waste Mfg. Co., on Hermitage St., Manayunk. Their factory which was recently burned down has been rebuilt and is now being operated full time on woolen and cotton wastes with 1 press, 1 picker, 8 garnetts and 2 dusters. The plant is run by steam. The company is capitalized at $10,000. The capacity of the establishment is 20,000 pounds daily.

Pennsylvania, Philadelphia. It is reported that the old Harmony Mills, Walnut Lane, Manayunk, until recently operated by Clayton G. Rice on cotton, woolen and merino yarns, have been leased by the Aberfoyle Mfg. Co. of Chester, Pa., who will install in it new looms and operate it as a branch of the Chester plant.

Pennsylvania, Philadelphia. The contract has been awarded for the erection of the foundations for two new tanks to hold respectively 10,000 and 20,000 gallons each, for Henry Holmes & Sons, manufacturers of ingrain carpets and art squares, operating 105 looms, at Trenton Avenue and Auburn Street.

Pennsylvania, Philadelphia. New boiler foundations at a cost of $500 are to be put up by Messrs. John D. Grover & Sons, Somerset and Tulip Streets, scourers of wool and hair.

*Pennsylvania, Philadelphia. Work has been commenced on the new additions to the factory of the Shackamaxon Worsted Co., at Allegheny Ave. and Hancock St. A four-story addition 102 by 45 feet will be built to the factory on the North Side of Allegheny Ave., west of Mascher St.; two fourth-story additions to the old building; a one-story addition 30 by 40 feet in the rear of the factory at Hancock and Mascher St., and a new one-story boiler house, 28 by 40 feet 3 inches at the

northeast corner of Hancock St. and Allegheny Ave.

Pennsylvania, Philadelphia. The Fern Rock Woolen Mills, Trenton Avenue and Wishart St., manufacturers of cloakings, overcoatings and woolen dress goods on 224 looms, have started up a branch factory at Palethorp and Oxford Sts., in the third floor of the Dolan Mill where they have put in sixteen broad and fifty narrow looms which they are operating on dress goods.

Pennsylvania, Philadelphia. The Penn Worsted Co., Howard and Jefferson Sts., which has been operating 16 broad looms on men's wear and dress goods have added 8 new looms, new machinery for turning out novelty yarns and fancy twists, consisting of 1,500 spindles and also a plant for finishing broad silks for the trade. The company has a capital of $20,000; H. P. Sack, president, superintendent and buyer; and William Messmer, treasurer. Their goods are sold through New York.

Pennsylvania, Williamsport. Messrs. H. E. & J. C. Holtsizer, proprietors of the Williamsport Woolen Mills, manufacturers of cassimeres, cheviots, worsteds and yarns on 2 sets, 624 spindles and 11 broad looms, report that they are about to incorporate their business under the name of the Williamsport Woolen Mills, the new concern to have a largely increased capital with which to conduct their operations. It is also their intention to increase the capacity of the plant in all departments at an early date.

Rhode Island, Oakland. The Coronet Worsted Mills are to install 20 to 30 new looms in the plant.

Rhode Island, Providence. The Atlantic Mills are to erect a new building for dyeing, bleaching and finishing.

*Rhode Island, Providence. The Queensbury Mills of Worcester will start operations April 15th in the Rhode Island Worsted Mills' property, recently reported leased. This has been done for purpose of increasing capacity of the company's output. They will make worsted yarns up to and including 2/36s.

*Rhode Island, Woonsocket. The new addition for the Scotia Worsted Company has been completed and the new looms are being installed.

*Tennessee, Cleveland. An addition will be built to the Cleveland Woolen Mills, making the plant 300 by 60 feet, four stories. The machinery equipment will be increased to 10 sets. This plant is operated on cassimeres, diagonals, etc.

*Utah, Provo. The Provo Woolen Mills Company is to install two 100 h. p. boilers in the mill and a new boiler house will be built.

*Virginia, Winchester. The Virginia Woolen Co. has completed erection of addition to plant and installed two additional sets cards and 16 looms.

Mills Starting Up.

*Maine, Brookville. Operations will be started about May 1st, by Wm. Knox, in mill formerly run by J. G. Walker. Hosiery yarns from 4 to 12 cut, 2 and 3 ply, will be made; will also do custom roll carding. This plant is equipped with 2 sets cards and 4 looms (not in use).

*Massachusetts, Lowell. The Arlington Mills (Lawrence), will start operations April 1st in their new branch mill.

*Massachusetts, Monson. Operations have been resumed in S. F. Cushman & Sons' woolen mill, which has been closed for some time.

*Massachusetts, Oxford. The Pierrepont Mills are operating the plant formerly known as the Buffumville Mfg. Co. on woolen yarns on commission. They are running 2,576 spindles and 4 sets cards.

Pennsylvania, Doylestown. The Clear Spring Worsted Mills, C. Holmes & Sons, proprietors, who recently started up the mill formerly operated by the Doylestown Worsted Co., have just put on the market their first lot of goods. They are manufacturing fine serges, cheviots and worsted yarns, operating 24 looms and 4,600 spindles.

*Rhode Island, Wickford. Operations have been started in the Wickford Worsted Mill, under management of J. E. Fletcher. It is expected that the plant will be running in full in about two weeks, making worsted goods.

Mills Shutting Down.

California, San Francisco. The Golden Gate Woolen Mills have been shut down for several months past.

Canada, Toronto, Markham. The Maple Leaf Woolen Mills are about to be closed down.

Connecticut, Winnipauk. The Norwalk Mills have been closed indefinitely.

*Massachusetts, Uxbridge. The entire plant of the Hecla Mill has been shut down. The company's property will be sold at auction late in April.

For Knitting Mill News, see Knitting Department.

SILK.

New Mills.

*Connecticut, Mansfield Centre. M. L. Brown & Co. will start a new plant May, 1905, making machine twist and sewing silk. Product will be sold direct. This is company in which Henry L. Brown was reported interested in recent issue under Willimantic.

*Connecticut, Norwich. The Norwich Silk Company will start operations in their new plant about April 15th, making machine twist and sewing silk. Geo. A. Smith is agent for the mill and Geo. A. Gager, superintendent.

New Jersey, Paterson. The Belmont Silk Co. has been incorporated with capital stock of $10,000. Wm. J. Barbour is agent of the new company.

*New Jersey, Paterson. Herbert Lubelski is president of the Luvan Silk Co., recently incorpo-

rated with capital stock of $50,000 and John R. Blancom, treasurer. They operate a plant of 30 looms and sell product through Bachmann, Emmerich & Co., New York.

New Jersey, Union. The Hudson Silk Company has been incorporated with capital stock of $100,000. Warner Smyth, Francis de Paul Leonard and Vincent J. Irving are the incorporators.

New Jersey, Paterson. The Demarest Silk Co.'s plant is equipped with 160 spindles and 10 looms, for making broad silks. Use steam power. This company is capitalized at $50,000; G. W. Demarest is president of the company. Fleitmann & Co. are the selling agents.

*New York, Canisteo. The Canisteo Silk Company has been incorporated with capital stock of $30,000. F. P. Merrill of Hornellsville is interested in the project.

New York, Unionville. Operations will be started up shortly by Mr. Toner in the silk mill which has been idle for some time.

Pennsylvania, Burmont. The recently incorporated Watt Manufacturing Co. will commence its operations at this place, which is a short distance from Clifton Heights in Delaware Co. The company will manufacture silk fabrics. The officers are: D. Edgar Coe, president; L. M. Calvert and D. Edgar Allen Coe, vice presidents and G. Oswald Calvert, secretary and treasurer.

*Pennsylvania, Easton. Joseph P. Smith and Hartley J. Haytock are among those interested in the Northampton Silk Company, recently organized with capital stock of $16,000.

Pennsylvania, Hazleton. The Hazleton Silk Company has been organized by W. H. Edam (Hazleton) and N. E. Huebschman (Paterson, N. J.). Operations will start with 30 looms.

Pennsylvania, Lansdowne. The General Artificial Silk Co., which recently failed, and whose plant was sold at auction, was bought in and is now being run by the Genasco Silk Co., Montgomery Waddell being the manager. The new company is manufacturing artificial silk as heretofore.

Pennsylvania, Philadelphia. The Excelsior Braid Mills is a new concern which is manufacturing silk and cotton braids on 181 braiders, run by electricity, at 346 Walnut Lane, Germantown. The production is sold through Fleming & Chapin, Philadelphia.

*Pennsylvania, Philadelphia. The Oxford Silk Co., recently incorporated with $30,000 capital, is about to start its operations in the Oxford Mills at Front and Oxford Streets, operating 12 looms, on silk ribbons. Product will be sold through New York. The officers of the company are W. H. Trainer Kerr, president; H. J. Feit, treasurer, and Emil Scherr, manager, superintendent and buyer.

Rhode Island, Central Falls. The Leader Weaving Company has been incorporated recently with capital stock of $100,000 and has leased part of the old Stafford Mill. Operations will begin shortly with 26 looms, making satins, silk fabrics, taffetas, etc. The number of looms will be eventually increased to 100. Harry C. Curtis is president of the company, Thomas W. Bicknell, secretary and treasurer and Harry S. Hewett, superintendent and general manager. Company will have an office at 49 Westminster Street, Providence.

*Rhode Island, Central Falls. The Leader Weaving Company will start operations March 20th, with equipment of 800 spindles and 50 looms. They will sell goods direct.

Enlargements and Improvements.

Connecticut, Mystic. An addition is being built to the Rossie Velvet Mill.

Connecticut, Willimantic. The Holland Silk Mills' building is being improved and additional machinery will be installed on the top floor of the building.

New Jersey, Phillipsburg. New machinery is being installed in the Ashley & Shaw Silk Company's mill.

New York, Chadwicks. The old Stewart Mill property has been purchased by the Standard Silk Company and will be equipped with new silk machinery.

*Pennsylvania, Allentown. Work will start about April on the new building to be built by the Phoenix Silk Mfg. Co. They will install 600 looms.

Pennsylvania, Allentown. Fifty new looms have been received at the Dery Silk Mill.

*Pennsylvania, Easton. The Easton Silk Company, reported to install additional machinery in the plant, will have a total of 120 looms when completed. This concern makes silk dress goods.

Pennsylvania, Kingston. Hess, Goldsmith & Co., operating large silk mill at Wilkesbarre, will build a new mill at this place, to employ some 500 people. As soon as bids are received work will start on erection of a brick building, 300 by 60 feet, three stories, with separate boiler and engine houses. It is expected to have the new building completed by middle of the summer.

*Pennsylvania, Kingston. Work will be started May 1st by Hess, Goldsmith & Co. on erection of their new mill, which they propose having ready to start up by September 1st.

Pennsylvania, Philadelphia. Alterations are being made to the Sauquoit Silk Manufacturing Company's mill on Clarion Street.

*Pennsylvania, Philadelphia. Work will start shortly on the additional building for the Orinoka Mills, which has been previously reported in detail.

Pennsylvania, Topton. It is reported that the Hartley Silk Mfg. Co., manufacturers of broad silk on 80 looms, are about to erect an addition to their plant 100 by 60 feet. The company has a capital of $15,000. N. Hartley, president and John Hartley, treasurer, superintendent and buyer. The goods are sold direct.

Pennsylvania, West Pittsburg. A new silk mill is to be built here by Woodhouse, Bopp & Co., now operating a plant. The new building will be 540 by 90 feet, one story, brick, and will be equipped

with about 350 looms. It is expected to have the new building completed by September 1st.

MISCELLANEOUS.

New Mills.

Connecticut, Derby. The Standard Cloth Company has been incorporated with capital stock of $100,000 for bleaching, dyeing and finishing cloth. F. A. Russ (Greenwich), is president and treasurer of the company, Stephen J. Leonard (New York), vice president and Geo. R. Brown (New York), secretary.

Maryland, Baltimore. The Johnson-Dukehart Company has completed equipping their new plant for making all kinds of netting and twine used in the fishing industry. Joseph D. Chesney is president of the company; Samuel Corkran, secretary and treasurer and Joseph B. Casey, vice president and general manager.

*Pennsylvania, Allentown. The Laurel Hill Dyeing Company, Joseph Pozzi and William G. hringer, proprietors, have begun operations. Plant is equipped for dyeing cotton, silk, spun silk, ribbons, etc.

Pennsylvania, Philadelphia. John Iliffe is conducting a skein silk dyeing plant with a capacity of 150 lbs. a day at 1112, 14 and 16 North Front St. and reports business as good.

Pennsylvania, Philadelphia. Alexander R. Cullin, for four years foreman dyer for George Brooke & Son, 55th Street and Wyalusing Avenue, manufacturers of upholstery goods, etc., is about to start up a dye house at Mascher and Columbia Avenue, where he has leased the old dye house in the Irwin Mills, which is now being fitted up throughout with new machinery for the dyeing of cotton, woolen and worsted skein yarns and mercerized yarns with a capacity of 3,000 pounds per day. Mr. Cullin will run the establishment under the name of the Colonial Dye Works.

Pennsylvania, Philadelphia. Incorporation papers have been asked for the Fibre Rock Manufacturing Co., Joseph C. Noble, Charles Schofield, Edgar S. Stafford, C. Gordon Stafford and Charles E. Murphy. It is reported the operations of new company will be commenced in one of the Stafford Mills in Manayunk on Krams Avenue, where they will manufacture fabrics of asbestos.

Pennsylvania, Philadelphia. A permit has been granted to the Hulton Dyeing & Finishing Co., 2712 Jasper Street, dyers and finishers of woolen and worsted cloth, for the erection of a one-story building, as an addition to their present plant, 146 by 61 feet, to cost $15,000. The new building will be erected at once. The company has a capital of $100,000 and is very busy.

Pennsylvania, Scranton. A new embroidery factory has been started here by Spruks Brothers.

Rhode Island, Providence. The Narragansett Finishing Company has been incorporated with capital stock of $25,000. Chas. J. Obermayor, Thomas P. Himes and Geo. L. Cooke are the incorporators. They will dye, bleach, print and finish all kinds of goods.

Enlargements and Improvements.

*Connecticut, Jewett City. The new building for the Jewett City Textile Novelty Company will be 50 by 125 feet, three stories, brick, of heavy mill construction. The new plant is to be completed and ready for occupancy by June 1st.

Connecticut, New Haven. The Pond Lily Dyeing Co. is building an addition to their plant.

Massachusetts, Peabody. An additional story 150 by 55 feet is being added to the Danvers Bleaching & Dye Works.

Pennsylvania, Philadelphia. A permit has been granted for the erection of a three-story dyehouse, 77.8 1/2 by 82.6 feet, on Boston Ave., west of Emerald St., for the Firth & Foster Company. The cost is estimated at about $20,000. Work will be pushed as rapidly as possible to completion.

*South Carolina, Greenville. To provide for improvements and ample working capital it is reported that the Union Bleaching & Finishing Company, by the sale of $60,000 treasury stock, made their total capital $300,000, as originally authorized.

Mills Starting Up.

*Massachusetts, Methuen. The new plant of the Tekcips Dyeing & Finishing Co. will be in operation April 1st.

*Rhode Island, Riverpoint. Operations have been started by the Continental Finishing Co.

FAILURES AND SUSPENSIONS.

Indiana, Indianapolis. The Indiana Woolen Manufacturing Co. and the Eclipse Woolen Mills of Louisville, Ky., have made an assignment; the liabilities of both mills amounting to about $326,000. Both mills are controlled by D. A. Chenowith of Indianapolis, who has also made a personal assignment. The Eclipse Mills had a capital of $150,000 and manufactured Kentucky jeans, fancy cassimeres, meltons and shirtings on 13 sets, 245 narrow looms and 42 broad looms and two pickers, which they dyed and finished, John Nightengale being the superintendent.

New Jersey, Summit. The Summit Silk Manufacturing Co. has filed a voluntary petition in bankruptcy. The liabilities are placed at $272,561.69 with no assets.

Pennsylvania, Crum Lynne. S. Longbottom & Sons, the firm consisting of Smith Longbottom, J. Harry Longbottom and Frederick H. Longbottom, who operated 5 cards, 4 combs and 3,800 spindles on worsted varns, have been adjudged bankrupts by the U. S. District Court. The liabilities are given as $75,011.58; assets, $9,884.63. Smith Longbottom's liabilities are $31,294.39; assets, $95,523; J. H. Longbottom's liabilities, none; assets, $160; F. H. Longbottom's liabilities, none; assets, $120. The referee is George E. Darlington.

Pennsylvania, Mechanicsburg. The Windsor Knitting Company has made an assignment to H. H. Mercer Sons.

Personals.

Cotton.

Frederick A. Flather, of Chicago, and formerly of Lowell, has been elected treasurer of the newly reorganized Boott Mills.

F. S. Mosher has been appointed superintendent of the F. W. Poe Manufacturing Co., Greenville, S. C.

The Dillon Cotton Mills, Dillon, S. C., have adopted the American Moistening Company's system of humidifiers.

J. A. Shinn has resigned as superintendent of the Victoria Cotton Mills, Rock Hill, S. C., to accept the superintenuency of the Central Mills, Sylacauga, Ala.

Edward Pearson, late with the Merrimack Mfg. Co., Lowell, Mass., is superintendent of the Aurora (Ill.) Bleachery and Dye Works. He succeeds Henry Rowe.

James C. Reid, at a meeting of the directors of the Meridian Cotton Mills, Meridian, Miss., held on Monday, March 6th, was unanimously elected general manager. Mr. Reid has been superintendent of the Altamahaw Cotton Mills, Elon College, N. C., for the past eight years, and previous to coming South was superintendent of the Parkhill Mills of Fitchburg, Mass. He will enter upon his new duties as soon as his successor at Altamahaw can be appointed.

Chester D. Hatch has been appointed agent of the Exeter Manufacturing Company's mills in Exeter, N. H., to take the place of the late George E. Kent. Mr. Hatch was born in Middlesex, Vt., and went to work at the age of 14 years in the Stark Mills at Manchester, and has gradually worked his way up to agent.

Jesse Whitworth has resigned his position in the bleachery of the Monadnock Co., Claremont, N. H., to accept a position as foreman of the quilt department of the Lowell Bleachery, Lowell, Mass.

David Grover has resigned as overseer of the spinning department in the Totokett Mill, Norwich, Conn. W. Lancaster from Berkeley, R. I., is his successor.

Herbert Davis, overseer of weaving at the Linwood Cotton Mill, Whitinsville, Mass., has resigned. His place has been taken by a man from Manchuag.

E. A. French, superintendent of the Huntsville (Ala.) Cotton Mill Company, has resigned.

John Somers is the new overseer of finishing at the Lawton Spinning Mill, Woonsocket, R. I.

J. G. Fish has returned to Turner's Falls, Mass., to succeed Charles Weaver as foreman of the spinning room at the cotton mill.

Howard F. Curtis completed work at the Summit Thread Company's mill in East Hampton, Conn., recently, and has gone to Springfield, Mass., to act as foreman in the dyeing room of a mill there.

John Ridchester, overseer of the finishing department of the Lawton Spinning Co., Woonsocket, R. I., has resigned to accept a position with the New England Yarn Company in New Bedford, Mass. His successor at the Lawton Spinning Co. is John Somers, who has been secondhand. Mr. Ridchester was presented with a gold watch, chain and charm and also a meerschaum pipe by the employees in his department and other mill associates.

J. St. George, recently superintendent of the United States Thread Co., at Leominster, Mass., has resigned. Mr. Hunter, lately in the employ of John C. Meyer & Co., Jamaica Plain, succeeds him.

James O'Brien, overseer of the dressing department at the Chicopee Mfg. Co., Chicopee Falls, Mass., has resigned.

Alexander F. Shaw, resident manager of the Greenville Bleachery, one of the branches of the United States Finishing Company, has resigned to accept the superintendency of the print works of the Aspinook Company, Jewett City, Conn.

Messrs. Tolar, Holt & Hart, Fayetteville, N. C., have adopted the American Moistening Company's system of humidifiers.

John A. McLoughlin of New Bedford, Mass., is the new overseer of the weaving department at the Globe Mill, Woonsocket, R. I.

Patrick J. Dowd, for many years overseer in the cloth department at the Boston Manufacturing Co., Waltham, Mass., has resigned, and hereafter James McQuestian, who has been foreman of the finishing department, will act as overseer of both departments.

J. D. Bruice, superintendent of the Loray Cotton Mill, Gastonia, N. C., has resigned to accept the superintendency of the Gaffney (S. C.) Manufacturing Co.

The People's Factory, Montgomery, Ala., have adopted the American Moistening Company's system of humidifiers.

Albert Williams, formerly overseer of weaving at the Tillotson Mfg. Co., is now with the J. L. & T. D. Peck Mfg. Co., Pittsfield, Mass. He succeeded Alexander Costine.

Joseph Roy has resigned as overseer of the cloth room at the Eagle Mill, Woonsocket, R. I., after 18 years of faithful service. He has been appointed assistant factory inspector. Peter I. Peloquin will succeed Mr. Roy at the Eagle Mill.

Messrs. Huguet-Merrill Company, Hornellsville, N. Y., have adopted the American Moistening Company's system of humidifiers.

F. C. Cumnock is the new superintendent at the Georgia Manufacturing Co., Gainsville, Ga., and Frank O'Neil is the new overseer of carding at this mill. He was formerly of Sylacauga, Ala.; Mr. Cumnock was formerly of Burlington, N. C., and Chicopee, Mass.

Henry McDermott succeeds C. A. Pender, resigned, as superintendent of the Brenham (Texas) Cotton Mills.

George W. Chapman, secondhand in the weaving department of the Royal Bag & Yarn Mfg. Co. of Charleston, S. C., has been promoted to overseer of that department.

E. C. Gwaltney, of Lancaster, S. C., has accepted the superintendency of the Fairfield Cotton Mills, Winnsboro, S. C.

C. B. Haynes, formerly of Anderson, S. C., will succeed Mr. Shinn as superintendent of the Victoria Mill, Rockhill, S. C.

Mr. Shipp of the Pelham Mills has been engaged for the position of superintendent by the Royal Bag & Yarn Mfg. Co., Charleston, S. C.

The Jackson Company, Nashua, N. H., have placed a repeat order for humidifiers with the American Moistening Company, Boston, Mass.

Joseph Holmes, for many years superintendent of the Oella Cotton Mills for W. J. Dickey & Sons, Oella, Md., has resigned, in order to retire from active life. Charles Heritage of Philadelphia has been appointed superintendent to succeed Mr. Holmes.

Thomas F. Carroll, for 15 years with the W. Warren Thread Works, Westfield, Mass., has been chosen superintendent, to succeed James Harries. Mr. Carroll began as an office boy with the thread company.

Ira L. Curry, boss weaver at the Woodstock Cotton Mills, Anniston, Ala., has resigned.

R. Gaines has recently resigned as superintendent of the No. 1 mill of the Bibb Manufacturing Co., Macon, Ga. Mr. Gaines is the new superintendent at the Forsyth Mfg. Co., Forsyth, Ga.

J. O. Thompson, superintendent of the Wamsutta Mills of New Bedford, Mass., has accepted the superintendency of the Wampanoag Mills, Fall River, Mass.

J. C. Massee is the new superintendent of the Madison Mills, Huntsville, Ala.

A. J. Platt, for the past two years overseer of carding for the Libbey & Dingley Co. at Lewiston, Me., has accepted a position as overseer of carding for the Bates Mfg. Co., same city, where he has charge of their large department. Mr. Platt is a man of wide experience, and previous to going to Lewiston was overseer of carding three years in New York Mills.

J. W. France, who was for a number of years overseer of weaving at the Aberfoyle Mfg. Co., Chester, Pa., and who was obliged to relinquish that position for a year or more on account of ill health, having now fully recovered his health has again engaged with the company as assistant to the manager.

Woolen.

Charles Loridan has resigned as president and general manager of the Loridan Worsted Company at Woonsocket.

Jonathan Benn, overseer of spinning at the Wayne Junction, Philadelphia, Pa., Spinning Company, has resigned.

John Hodgson has been engaged as assistant superintendent by the Southwark Mills Company, Philadelphia, Pa.

William R. Shanks, superintendent of the Rockstone Mills, Downington, Pa., has resigned.

J. A. Ruel, Dexter, Me., has accepted the overseership of spinning and weaving at the mill of the Hanover, Ill., Woolen Manufacturing Company.

Massachusetts Mohair Plush Company, Lowell, Mass., have placed a repeat order for humidifiers with the American Moistening Company.

F. N. Kimball has resigned as overseer of finishing for the Rochester (N. H.) Woolen Co.

Thomas Buckley, formerly of Franklin, Mass., is now superintendent of the Binghamton (N. Y.) Felt Company.

Frank Kimball, overseer of finishing for the Rochester (N. H.) Woolen Company, has resigned.

Thomas W. Rawley of Putnam, Conn., has accepted a position as superintendent in a woolen mill in Rochester, N. Y., and has entered upon his duties.

Michael J. Crowley has accepted a position as overseer of ring spinning in the Hamilton Mills at Amesbury, Mass. Mr. Crowley has been at the Blackstone Company for seven years.

Walter H. Stolworthy, who has been employed at the American Woolen Co.'s mill in Olneyville, R. I., has been placed in charge of the wool department. He now has entire oversight over this branch of the mill's business, buys the wool and sells the waste, etc. Mr. Stolworthy was promoted to succeed his brother, George Stolworthy, who has purchased a farm in North Attleboro, Mass., where he will carry on the poultry business.

John Bond, formerly with the Wickford Worsted Mills, Wickford, R. I., has taken a position as designer with the Anchor Mills, Harrisville, R. I.

Robert Hill of Maynard, Mass., has succeeded Edward Slugg as overseer of finishing at the Saranac Mill, Blackstone, Mass. Mr. Slugg has gone to Bristol, R. I.

A. L. Bowes, late superintendent of the Binghamton (N. Y.) Felting Co., is now employed with the Faatz-Reynolds Felt Co. of Lestershire, N. Y., of which W. C. King is superintendent.

Edward Chase, superintendent of the Chase Manufacturing Co., Waterville, Me., was presented with an office chair by the overseer of the company. Mr. Chase leaves for Readfield, to take charge of the company's interests there. His successor is C. L. Lincoln, formerly superintendent of the Bridgeton Woolen Mills.

Oliver Senior, who has been living in Springville for some time, has been engaged as manufacturing superintendent of the Provo Woolen Mills Company, Provo, Utah, to succeed George Dunham, resigned.

W. Rogers of Worcester, Mass., has succeeded James M. Morton as designer and assistant superintendent in the Camden Woolen Mill, Camden, Me.

F. L. Kimball, superintendent of the Brigham Woolen Co., Dayville, Conn., has resigned.

John McMellen of North Adams, Mass., is boss dyer for the Greenville (R. I.) Woolen Co.

F. C. Wilson has recently accepted the position of finisher and dyer in the Brookville (Pa.) Woolen Mills.

William Barras, formerly superintendent of the Unity Woolen & Worsted Mills, Frankford, Philadelphia, Pa., resigned his position and is now with the Empire Cloth Manufacturing Co., Philadelphia.

Clark B. Saunders has taken charge of the finishing department for the American Woolen Co., North Vassalboro, Maine. Mr. Saunders comes from Dover, N. H.

Richard Hill, until recently finisher in the Assabet Mills, has taken a position as boss finisher and superintendent of the Saranac Mills of the American Woolen Co. at Blackstone.

Turner Rollinson, boss dyer at the Kennebec Mills, Fairfield, Me., has resigned, after four years' service there.

Silk.

E. E. Elwood of Allenwood, N. J., has been made superintendent of the Eagle Silk Mills, Shamokin, Pa. James Brown, of Philipsburg, has received appointment of assistant superintendent. These positions were recently created by the removal of Charles Eagle to New York, where he will take charge of the office there.

Messrs. Cheney Brothers, South Manchester, Conn., have ordered an increase in their humidifying system of the American Moistening Company, Boston, Mass.

Deaths.

A. H. Stephenson, secretary of the A. C. Staley Manufacturing Co., South Bend, Ind., underwear manufacturers, died suddenly at Louisville, Ky., while on a business trip, of apoplexy. He was one of the prominent men of South Bend and an ideal citizen in all his public and private relations. With his three brothers he took an active part in the business of the company.

Frank C. Travers, of the firm of Travers Brothers, cordage manufacturers, died recently at his winter residence, New York City. Mr. Travers was one of the most prominent citizens of Oyster Bay, and a personal friend of President Roosevelt.

William H. Mayo, father of George D. Mayo of the Geo. D. Mayo Machine Co., died at the home of his son, in Laconia, N. H., February 26th, aged seventy-nine years. At one time he was associated with his son in the knitting machine business, and always took an active interest in the work going on in the shop, even when in advanced years being frequently about the works and keeping in touch with the development of the knitting machine and his son's latest inventions.

James Wilson, head of the firm of James Wilson & Sons, cotton tape and carpet binding, Philadelphia, Pa., died March 12th, aged 84 years. Mr. Wilson was a native of Belfast, Ireland, coming to this country when a young man.

A. M. Kale, superintendent of the Nims Manufacturing Company, Mount Holly, N. C., is dead, and Earl Carpenter, son of O. D. Carpenter, proprietor of the Harden Mfg. Co., Worth, N. C., is perhaps fatally wounded as the result of a duel growing out of a quarrel over the employment of mill help.

Cyrus Osmond Fosdick, for 45 years an overseer in the dressing department of the Atlantic Mills, Lawrence, Mass., died at his home in that city recently, aged 87 years. He retired in 1899, his advanced years compelling him to give up active duties.

Byron A. Stone, president of the Paragon Knitting Company, and vice president of the Mohawk Valley Knitting Mills, Mohawk, N. Y., died recently. He was 56 years of age.

Theodore Schiess, a prominent embroidery, silk and lace manufacturer of Manhattan, died at his home there March 27, from heart failure. Mr. Schiess was born in Germany, and was in his forty-eighth year. He came to Brooklyn, N. Y., twenty-three years ago, and was a member of a number of German societies and clubs.

James Harris, superintendent and treasurer of the New Hartford (N. Y.) Cotton Manufacturing Co. since 1875, died recently, aged 66 years.

Augustus H. Cobb, banker and half owner of the Suffolk Knitting Mills, Richmond, Va., committed suicide in his office at Suffolk March 10th, by shooting himself through the head. He was a native of Brunswick, Me.

William Ziock, president of the Rockford Mitten & Hosiery Co. and of the Burson Knitting Co., Rockford, Ill., died March 21st, in a St. Louis hospital, following an operation.

Chelsea Cook, president of the Tucker & Cook Mfg. Co., cottton yarns, Conway, Mass., died recently of pneumonia and weakness of the heart. For many years he had been a prominent citizen of Conway.

Hon. Louis Schneck died recently. He was born in Wurtemburg, Germany, in 1831. He came to America in 1852 with his parents, the family first settling at Cincinnati. When the Seymour Woolen Mill was organized at Seymour, Ind., in 1872, he was made president and general manager, which position he held until his death. Mr. Schneck was also vice president of the First National Bank in Seymour and had many other business interests here and elsewhere. He also owned several farms.

Michael J. McGuirk, agent of the Madison Woolen Company, Madison, Me., died recently. Mr. McGuirk was born in Bradford, England, in 1839, and came to this country when 10 years old.

E. Louis Metzger, president of the Ivins, Dietz & Metzger Company, carpet manufacturers, died recently at his home in Philadelphia, Pa. He was a man of wide business interests, being president and director of a number of industrial concerns.

William Montgomery Ayres, Sr., member of the firm of William Ayres & Sons, manufacturers of horse blankets, etc., died march 26, at his cottage in Atlantic City.

New Publications.

[Any work noticed under this head can be obtained through the office of this journal.]

The American Directory of the Knitting Trade in United States and Canada for 1905. Compiled by the Textile World Record, Lord & Nagle Co. Price $1.00.

This edition marks the twenty-third year of this publication, and is the best that has yet been published from the standpoint of accuracy, completeness and information for the trade.

From year to year additional information about the knitting mills has been added, and the mill reports now include the names of officers of companies, character of goods made, the number and kind of knitting machines and sewing machines, whether the mill does its own dyeing, finishing and bleaching, kind of power employed, whether the goods are sold direct or through agents, the name and address of the agent, if the mill buys yarn what kinds and sizes of yarns are bought, and in many instances the name of the buyer. Railroad connections and population of the cities and towns are given.

The full report of the mills is included under the cities and towns in which they are located, arranged alphabetically by states. There is also an alphabetical index to knit goods manufacturers, arranged by names of mills.

Besides the mill section there is a very complete directory of manufacturers' selling agents handling knit goods, in most instances giving the names of the mills for which they sell and the persons in charge of the knit goods department: lists of jobbers and wholesalers of knit goods and all large department stores and large retailers handling good knit goods, which are more complete than ever before; the names of department buyers are given.

A new list of dyers, bleachers, finishers, printers and extractors of knit goods has been added.

The large number of advertisers of knitting machinery, sewing machines, knitting mill supplies and everything relating to the knitting branch makes the classified Buyers' Index for machinery, supplies and yarn almost a complete directory in itself, as there is hardly a machinery or supply house selling to the knit goods manufacturers which is not represented in its advertising pages and Index, so that this feature is of great reference value for knitting manufacturers.

Simplex Yarn Tables; Lord & Nagle Co., Boston, Mass. Price 50 cents.

The lack of a convenient collection of yarn tables has led to the publication in book form of the well known Simplex Tables which appeared some years ago in the Textile World Record Directory. The first table gives the corresponding equivalents of each yarn size by the run, cotton, worsted, linen and metric systems and yards per pound, also by the grains per 120, 50, 25, 12 1/2 and 6 1/4 yards. A reed table gives the width obtained by various sets in warp and filling and total ends per inch. A cloth table gives the calculated weight per yard for various sizes of yarn and ends in warp and filling. There are tables of knitting machine gauges, yarn sizes for knitting machines and standard sizes for underwear and hosiery. Also a table of the breaking strength of American cotton warp yarns.

Cotton Manual; by J. T. Broadbent, instructor in carding and spinning, Bradford-Durfee Textile School, Fall River, Mass.; Lord & Nagle Co., Boston. Price 75 cents.

This is intended as a textbook of the cotton fibre and includes a large amount of information on the cultivation and marketing of cotton. It is written in a clear style and it is seldom that so much information regarding cotton is found in an equal space. The reading matter is arranged in the form of questions and answers. The author brings to the work of preparing such a book an experience in the South where he had the opportunity of studying at first hand the cultivation of cotton. He also has the advantage of a thorough practical knowledge of the manufacture of the fibre into yarn. There is a chapter on the baling of cotton and another on cotton mixing. The book is freely illustrated and will prove a valuable manual for all branches of the cotton industry.

Cotton Facts, 1905; Alfred Shepperson, New York City.

This edition brings Cotton Facts up to date. The work is so well known that it is unnecessary to refer to its contents in detail. It has become the standard handbook of the cotton trade and should be in the possession of every cotton grower, dealer, manufacturer and handler of cotton goods.

Registration of Trademarks under the New Trademark Act; by Arthur P. Greeley; John Byrne & Co., Washington, D. C. Price 50 cents.

On April first an act passed by the last Congress revising the trademark law went into effect. The general aspects of the new statute are outlined in this pamphlet. The subject is one of importance to the textile trade. Every textile manufacturer should become familiar with the provisions of the law in relation to trademarks, under which his goods are protected against imitation.

Dockham's American Trade Reports, Textile Manufacture and Dry Goods Trade; C. A. Dockham & Co., Boston, Mass. Price $6.00.

The thirty-ninth year of Dockham's directory is marked by the appearance of the twentieth edition of that well known work. In addition to the regular directory of textile manufacturers, bleacheries and print works in the United States, Canada and Mexico, it contains lists of textile associations, cotton and wool dealers, cotton exchanges, directors of leading corporations, dry goods selling agents, wholesale dry goods dealers, and officers of manufacturing concerns. The latest edition is compiled with the usual care and calculated to retain the hold on the trade heretofore possessed by this work.

Diary and Reference Book, 1905; Indian Textile Journal, Bombay, India.

This book is divided into three parts, the first giving a list of the cotton mills in India, Japan and China. The second contains useful information for mill agents, managers and engineers, a list of

Indian and British patents, and rules relating to certificates and examinations of mechanical engineers in India. The third part contains a diary and calendar for 1905.

Modern Advertising. E. E. Calkins and Ralph Holden. D. Appleton & Co. Price $1.50.

Much has been written on the subject of advertising, but this new book by Ernest E. Calkins and Ralph Holden, approaches the subject with a full knowledge of and participation in the advertising developments and methods of the past few years. Modern advertising is as different from the old-fashioned patent medicine style of advertising as the methods of modern physicians and surgeons are from those of the apothecary and chemist-physician of two hundred years ago. Advertising may never become an exact science, but the intelligent attention and careful study that has been given to its problems have done much to bring it to a practical basis, and it is now recognized as being a necessary factor of any large business whose product eventually reaches the people. This new book treats of the subject from a broad standpoint and discusses not only the theory and principles of advertising, but its practical application in the different departments of the magazines and newspapers, bill boards, posters, its application to the general advertiser, the retail advertiser, and gives some practical details of the duties of the advertising manager, the advertising agency, the relations of the agency to the customer and some helpful hints on styles of advertising and preparation of copy. It is one of the Appleton Business Series, describing the different features of American commercial enterprises and has fitly been chosen as one of the earlier books in this series, because of the important place that advertising has taken in the upbuilding of American industry.

The Overseer of Power Weaving (Der Webmeister fuer mechanische Weberei); by Franz Kraus; Franz Deuticke, Wien and Leipzig. Price $1.00.

A practical handbook for weaving overseers and loom fixers. The first section is devoted to the construction of the loom, and is freely illustrated with diagrams of the different parts. The gears for regulating the picks in the cloth are calculated by the English inch, the Vienna inch and the centimeter, as the two former standards are the ones most used for this purpose in Germany and Austria. The second section is devoted to the causes of imperfect goods and it is here that the loom fixer and overseer will find the most valuable hints. The list of defects referred to is very comprehensive, but too long to be given here in detail. The third section takes up the principles of loom levers and driving belts. The text is in German and the book refers to German looms, but it contains much general information of value to all weavers.

Business Literature.

Bobbins and Shuttles; United States Bobbin & Shuttle Co., Providence, R. I.

A catalogue showing illustrations of 191 different types of bobbins, shuttles, spools and shuttle spindles manufactured by the United States Bobbin & Shuttle Company.

A Compound Engine Test, Buffalo Forge Co., Buffalo, N. Y.

This is an account of tests made by Prof R. C. Carpenter, M. M. E., professor of experimental engineering at Sibley College, Ithaca, for the purpose of determining the water consumption, mechanical efficiency and speed regulation and running qualities of Class "A" engine, built by the Buffalo Forge Co. A copy of the pamphlet can be obtained on application to the builders of the engine.

Catalogue No. 58; New York Blower Company.

A description of the reversible fan and one-piece fan wheel, which is believed to be something new in the construction of fans. The wheel is virtually cast into the wheel cone, making it smooth, solid, lasting and effective. The pulley can be placed either on the right or left hand side of this fan and the discharge opening can be pointed in any direction.

The Blue Book of Rope Transmission. The American Manufacturing Co., New York City.

An attractive catalogue beginning with a section on the transmission of power, after which the various advantages of rope driving are pointed out, the difference between the different systems being shown in detail. Next is a chapter on transmission rope. This is followed by practical talks on every-day questions relating to the subject matter of the catalogue. While it is designed to call attention particularly to the work and products of the American Manufacturing Co., the catalogue is in fact a technical treatise of exceptional merit which should be in the possession of everyone interested in the transmission of power. A copy will be sent free on application.

Graphite; Joseph Dixon Crucible Co., Jersey City, N. J.

The April issue of Graphite contains many illustrations of notable bridges and buildings in different parts of the world, together with much useful information regarding paint and painting. A copy of the publication can be obtained upon application to the Joseph Dixon Crucible Co.

Reynolds Corliss Steam Engines; Allis-Chambers Company, Milwaukee, Wis.

An illustrated description of the various Corliss engines built by this company including vertical, horizontal-vertical, compound, direct-connected, girder frame, heavy duty, rolling mill and blowing engines, and air compressors.

Maniplex Sewing Machines: L. F. Fales, Walpole, Mass.

This catalogue illustrates the different styles of sewing machines to which Mr. Fales gives the name Maniplex. These machines are furnished with any number of needles at distance apart varied to suit requirements, and there is a large range in length of stitch and capacity to handle thick material. He builds several styles of multiple needle sewing machines, both single thread and double thread (chain stitch) and double thread (lock stitch). This catalogue illustrates and describes the various types of machines.

Forges for Manual Training Schools, Railroad Shops, etc.

The New York Blower Company, 25th Place and Stewart Avenue, Chicago, with the usual progressiveness of this company, has incorporated several new ideas in the construction of forges. The moving device for down draft hoods is simple and efficient.

They also manufacture a full line of blowers, exhaust fans, ventilators and galvanized iron piping, and are prepared to furnish a full and complete equipment for any shop.

Non-Shrinkable Wool.

It is a fact that many manufacturers of woolen material which requires washing do not realize what an absolutely non-shrinkable product means to the public. One repeatedly hears such statements as this: "We never had any complaints of our goods shrinking." Of course they didn't; everyone knows that wool shrinks and it is taken as a matter of fact. Nevertheless, the people are welcoming with open arms woolen material that won't shrink. They are not complaining about the material that does shrink, that is taken for granted, but they are asking for the stuff that is "non-shrinkable," and with the advent of C. Scott Althouse's "Nevershrink" process, manufacturers are able to offer an absolutely non-shrinkable product.

This process is simple in its application and can be applied at a very low cost before the goods are finished. Repeated tests of this process have proven that it is, indeed, what its name indicates, a never shrinking process. These tests have been too numerous to mention here, but a very common one is that of wearing and washing woolen underwear that has been so treated, for several seasons.

The advantages of this process are found not only in the use of materials that are subject to frequent washings, but also in the production of various attractive effects in cloth patterns where wool is used in connection with fibres that shrink very little, if any, such as mohair or braid wool. Raised effects are thus produced by letting the wool shrink, which raises that portion of the weave made of the non-shrinking fibres. These effects can be produced by using the natural wool with non-shrinkable mohair or with other wool that has been treated with the "Nevershrink" process. This method of substituting non-shrinkable wool for mohair presents many advantages. In the first place entirely new effects can be produced, and then again the slippery nature of mohair and similar fibres presents a difficulty that would be entirely eliminated by this method. It is also possible to produce a softer piece of cloth than is otherwise attainable. Further information can be secured from Chas. H. Heyer, 1501 Real Estate Trust Building, Philadelphia, Pa.

Notice.

The National Electric Company of Milwaukee, manufacturers of the Christensen air brakes and electrical machinery, are now occupying additional offices in the Old Colony Bldg., Chicago, and have moved the general sales office of the electrical department from Milwaukee to Chicago.

The William Firth Company in New Offices.

The William Firth Company, which for a number of years has had its Boston offices in the Equitable Building, on April 1st removed to new quarters in the Post Office Square Building, 79 Milk St., only a short block away from their old location. The Post Office Square Building is the latest of Boston's modern office buildings, having just been completed. The offices of this company and the others with which Mr. Firth is closely identified as an officer, viz., American Moistening Co. and the American Textile Appliance Co., occupy a large suite especially planned for their use. The Post Office Square Building is midway between the North and South Stations on the main artery of traffic connecting the two terminals, and is directly opposite the Milk St. side of the Post Office and in the heart of the banking, cotton and machinery districts.

Mill Supplies.

C. J. Jones has resigned as salesman for the American Napping Machine Co., to sell a general line of textile machinery, mostly for the finishing and bleaching departments of woolen, cotton and knitting mills. He will act as agent for the Philadelphia Textile Chemical Works, Frankford, Philadelphia, Pa., manufacturers of fulling, scouring and bleaching soaps, filling for cotton goods, cotton softeners, boiler compounds, also napping machine wire clothing of all kinds.

Before going into the napping machine business Mr. Jones was finisher of woolen and cotton goods in several of the large mills in and around Philadelphia. He is thus well acquainted with all machinery and material used for finishing textiles. He has had about fifteen years' experience with nappers on all grades of goods, both woven and knit, cotton and wool, and is posted on napper clothing, both foreign and domestic, for single and double action nappers. He is prepared to overhaul and reclothe machines with new wire.

He has now opened an office at 156 West Lehigh Avenue, Philadelphia, where he will be pleased to hear from any manufacturers in need of anything in his line.

Unique Advertising.

We refer our readers to an advertisement of the Coburn Trolley Track Mfg. Co. which appears in this issue and draw special attention to the very unique "copy." The superiority of their product is represented by a giant. This advertisement is to be changed every month. We had the privilege of examining in advance the advertisements that are to appear in the forthcoming numbers. They show the giant performing many stunts. We congratulate the Coburn Trolley Track Mfg. Co. on the originality of the advertising. It will attract attention and interest manufacturers in their appliances. Their trolley track lifting and carrying device, which is shown in this issue of the paper, is simple, ingenious and effective. Watch for the future performances of the "benevolent giant."

Arc Lamps.

The American Arc Lamp Co. at Elwood, Ind., has succeeded to the business of the Lea Electric Mfg. Co., and greatly increased it. Some years ago the Lea Co., through mismanagement, became financially embarrassed and Mr. Walter Ramsey of Indianapolis was appointed receiver. During the past two years while acting as receiver, he has succeeded, through his personal efforts, in bringing the business up to a profitable basis and has greatly increased it. They are now erecting their own buildings in Kalamazoo, Mich., where they expect to remove about the middle or last of May. They have made many instalments of their lamps in cotton mills, especially in the Southern states, and under Mr. Ramsey's vigorous management and wide business and technical experience in the manufacture of arc lamps they expect to become an important factor, meeting the demand of the textile trade for high grade lamps at moderate prices.

The Neverslip Cop Spindle.

The first lot of Neverslip cop spindles manufactured under original patents of the company has now been in use long enough to demonstrate the advantages which they were claimed to possess, and also another important feature, which was not expected at the time they were put on the market, and that is, the saving of paper tubes.

It has been found that where shuttles equipped with the Neverslip cop spindle are employed, the paper tubes can be used a number of times in a large proportion of cases, whereas it is well-known that the long paper tubes are pressed on to the ordinary spindle so tightly that in most cases they have to be torn down or cut from the spindle and are then unfit for further use. Mills using the new spindle have called the attention of the manufacturers to this important fact of additional saving.

A new lot, which embodies improvements under their second patent, is now ready and deliveries are being made. From present indications the demand promises to tax their present facilities to the limit, and manufacturers who are desirous of testing this new device are advised to put in an order for a sample lot at an early date. The New York office is at 415 Broadway.

Cloth Washers and Fulling Mills.

The Hopkins Machine Works of Bridgeton, R. I., has recently been incorporated and the concern is now known as the Hopkins Machine Works, Inc. This business was originally established in 1836 by Augustus Hopkins, the great-grandfather of the present manager. It passed by direct inheritance from father to son successively to Horatio Hopkins and the late Col. A. S. Hopkins, the father of the present President and Treasurer.

This company manufactures a line of cloth washers, fulling mills, piece dyeing machines and specking and burling machines, dye tubs, tanks and vats, and a general line of machinery of that character. Their product is well and favorably known to the general trade and their machines are in a great many of the representative concerns of this country. The present officers recently elected are H. A. Hopkins, President; W. A. Hopkins, Treasurer and General Manager, and W. S. Hopkins, Secretary.

Water Power and Electricity.

The following statistics on water power used for generating electricity have recently been published in England:

United States	527,467 H. P.
Canada	228,225 H. P.
Italy	210,000 H. P.
France	161,343 H. P.
Switzerland	133,302 H. P.
Germany	81,077 H. P.
Norway and Sweden	71,000 H. P.
Mexico	18,470 H. P.
Austria Hungary	16,000 H. P.
Great Britain	11,906 H. P.
Russia	10,000 H. P.
India	7,050 H. P.
Japan	3,450 H. P.
South Africa	2,100 H. P.
Venezuela	1,200 H. P.
Brazil	800 H. P.
Total	1,483,390 H. P.

Atlantic City's Spring Season.

Atlantic City is the famous Spring resort, as is attested by the great throng which is now at this widely known Seaside City. Its great board-walk is as busy as on a Summer day and the weather, well it can't be beat. Not even the Metropolitan Centres have as many fine hotels as Atlantic and few have any larger. Every hotel contains every comfort which the most exacting guests might demand and the service is ever par excellence. The board-walk is of course the most attractive feature, but boating, fishing, gunning, golf and every outdoor sport is provided and the visitor who does not have a good time at Atlantic City is few and far between. The New Jersey Central is the natural route to Atlantic City and its fast 3-hour trains are as widely known as Atlantic City itself. The trains are vestibuled, have Buffet Pullmans and are exceptionally fast. They leave New York at 9.40 a. m. and 3.40 p. m. and 9.40 a. m. Sundays. Write for detailed folder to C. M. Burt, G. P. A., New Jersey Central, New York City.

Connecticut, Willimantic. It is reported that Henry L. Brown, formerly with the L. D. Brown Silk Company, has leased a portion of the National Thread Mill property and will install a plant for silk throwing.

Delaware, Wilmington. The Delaware Cotton Mills, which have been shut down for some time, it is said, will soon start up again. The mills manufacture dress goods and fancy shirtings on 550 looms, spinning their own yarns on 14,406 spindles, which they dye, bleach and finish.

Change in an Important Yarn Account.

The selling agency for the yarns manufactured at the Tremont and Suffolk Mills at Lowell, which has been in the hands of A. I. Croll and J. M. Prendergast & Co., has recently been transferred to Catlin & Co. This is a very large account, as the sale yarn product of these mills is estimated to be about 150,000 pounds per week. The cloth account remains where it has been for many years, with the firm of Smith, Hogg & Co.

The National Electric Co.

The new electric light plant at Cook County Court House, Chicago, is an example of an isolated plant in the centre of a large city, and is especially interesting therefore on this account, and all the more so since it replaces a former plant which had become obsolete. With the experience the engineers had had with the former plant, they were in a better position to judge of the advantage of generating their own current than would be the case if it had been an entirely new project. The fact that boilers are required for heating such a large building is undoubtedly a strong argument in favor of combining an electric light plant with this work, since the additional cost of the attendance required is not very great.

The building is lighted by 16 arc lights and 2,300 incandescent lamps. The voltage at the switchboard is 125. The generating machinery consists of one 100 Kw. and one 150 Kw. direct current, engine type, six pole generators built by the National Electric Company, Milwaukee, direct connected to engines of the four-valve, single cylinder type, the former running at 225 rev. per min. and the latter at 200 rev. per min. The engines are single cylinder with double slide admission valves and Corliss exhaust valves. The pressure of supply steam is 125 lbs. per sq. in.

The new plant is a great improvement on the former belt driven installation, there being now no appreciable noise or vibration, which is an important requirement of a plant installed in a public building of this nature. On several occasions the generators have had to carry a steady overload of 20 per cent., which they have done very satisfactorily, without any sparking or the necessity of changing the position of the brush holder yoke.

The engine room is conveniently located, being in the basement on a level with the street. This installation is, of course, a municipal plant and is a mark in the path of the progress in municipal ownership. It must have proved remunerative in the past, else the engineers would hardly have recommended the installation of another plant when the question as to whether it was better to generate their own current or to take it from a supply company arose.

The American Moistening Company, Boston, Mass., have reported a large increase in their business the last two months, showing orders from twenty-five different cotton, worsted and silk manufacturers. This system of maintaining proper atmospheric conditions in textile factories has the endorsement of many representative manufacturers.

The Nevershrink Process for Wool.

C. Scott Althouse, Reading, Pa., reports that he is meeting with continued success in introducing his Nevershrink process for wool. The process is easily, simply and cheaply applied, can be utilized at any stage of manufacture, and is said not to injure the fabric. It is evident that such a process can be applied to many branches of the woolen industry. Charles H. Heyer, Real Estate Trust Building, Philadelphia, Pa., is the selling manager.

Boston Branch of the Society of Chemical Industry.

The Society of Chemical Industry, with headquarters at London, is one of the largest chemical societies in the world and by far the most important one in English-speaking countries. Heretofore the American branch had its headquarters in New York, where meetings were regularly held. The members who lived at a considerable distance from New York had often found this arrangement to be rather inconvenient, and last month the New England members of the association formed a Boston branch. The executive officers of the Boston organization are Henry Howard, chairman, and W. H. Walker of the firm of Little & Walker, 93 Broad St., Boston, secretary. It is proposed to hold monthly meetings, when papers of general interest may be read and discussed.

An Educational Feast.

The Annual Conventions of the National Educational Associations are perhaps the foremost educational meetings of the world. Every educator of note is a member of the association and the meeting which this year is to be held at Asbury Park, New Jersey, July 3d to 7th, will be one of the best attended in years. The program is most comprehensive, covering a wider field than ever before and being at a typical Seaside City there are environs which cannot be duplicated. Asbury Park and its sister city, Ocean Grove, have ample accommodations for all who attend and the program which will be provided for the entertainment of the delegates is most complete. Asbury Park is but 50 miles distant from New York by rail and by the famous Sandy Hook Route. The distance is but 37 miles.

The New Jersey Central is the popular route from New York and the Sandy Hook boats are operated by this Company in connection with its "All Rail Line." The steamers are known as the "Asbury Park," "Monmouth" and "Sandy Hook" and during the Summer leave New York from Pier 81, North River, foot West 42d Street and from Pier 10, North River, foot Cedar Street. The Sandy Hook boats are the fastest craft in New York Harbor and likewise the most palatial. From the "All Rail Line stations," fast express trains leave and the running time to Asbury Park is less than 90 minutes. The New Jersey Central has just issued an illustrated descriptive folder for the N. E. A. Convention and by sending your name and address to C. M. Burt, G. P. A., 143 Liberty St., N. Y. City, you can get one without cost.

A New Spool and Bobbin Mill.

The Vermont Spool & Bobbin Co. of Essex Junction, Vt., are having plans drawn for a new mill, to be located in Burlington, Vt. The new building will be of concrete or cement building blocks, 50 by 150, two stories high, of approved mill construction throughout and sprinkled so as to make it as near fireproof as possible. The stock of the company is increased from $15,000 to about $60,000. Some lines of work not made by them in the past will be added, and they expect now to be able to fill requirements of their customers promptly and completely, so that anything in the line of spool and bobbin work will have their immediate attention.

Starching and Sizing of Colored Cotton Goods.

In the article on this subject which appeared on pages 101 to 104 in the March issue, it should have been stated that the illustrations were of a type of machine similar to those built by the Arlington Machine Works, Arlington Heights, Mass.

Sizing and Finishing Compounds.

Sizoleum, manufactured by the Arabol Manufacturing Co., 100 William St., New York, is said to make a most satisfactory sizing for cotton warps, sheetings, domestics and print warps, when mixed with Arabol starch, corn starch or potato starch. It is gaining ground in the South as it has the advantage of resisting climatic influences.

Improvement in the Appearance of Cloth Packages.

Everyone familiar with the mills and the markets must have been impressed with the marked improvement in the appearance of the wrappers used on many prominent lines of cotton, woolen and worsted dress goods. Some of them are really very artistic and most attractive, and the prospective purchaser is predisposed in favor of the goods at the very first glance at the package.

All up-to-date and enterprising mills are discontinuing the use of poor, cheap-looking wrappers, and are now competing with each other in placing their goods on the market in most attractive and pleasing manner, and we are told that even the cheaper cloths find a better market and bring a better price when put up in attractive packages.

On inquiry in cloth rooms of weaving and finishing plants it develops that much of the credit for this improvement is due to the efforts of the New York concern of Messrs. Richardson Brothers, who have long made a special study of the requirements of the textile trade and have been the originators of many attractive styles of wrappers and coverings for textile packages. It would pay any manufacturer either to make a visit to their offices at 542 Pearl Street, New York City, or to send his overseer of the cloth room to see the artistic beauty of their line of wrappers. They could not fail to get some ideas which would be profitable.

American Moistening Co. Removes to New Offices.

The head offices of the American Moistening Company in Boston have been removed from the Equitable Building, where they have been for many years, to the new Post Office Square Building, 79 Milk Street, where a handsome suite of offices, facing on Post Office Square, has been especially fitted up for their occupancy.

Agents for Business in Japan and China.

The growing importance of the business relations between the United States, Japan and China makes the announcement of a new commission house devoted especially to business with these countries of particular interest at this time. We direct attention to the announcement in our advertising columns of Messrs. Yagi & Merrill, manufacturers' agents for import and export business between the United States, Japan and China. This firm pays especial attention to cotton fabrics and to cotton mill machinery. Both members of the firm have had much experience and special training in these lines. The New York offices are 396 and 398 Broadway, and the Japanese branch is at 6 Teapo Street, Nagoya, Japan. Manufacturers who have never done business with the East are sometimes deterred by their lack of knowledge from engaging in this trade. Through the aid of a house like this, the business can be transacted easily, and as free from personal inconvenience and bother as if the goods were being sold for the Pacific Coast. The firm invites correspondence from interested parties.

The Progress Club.

A growing tendency among those connected with our large corporations to organize for purpose of mutual improvement is noticeable in all lines of trade. An interesting organization has just been perfected by those connected with the B. F. Sturtevant Co., of Boston, Mass., its object being to consider questions of engineering and commercial interest, and to increase the mutual acquaintance of the members. Its character is well suggested by its title, The Progress Club. Its membership is open to all, high or low, who are in any way associated with the company. Its membership, however, is classified into seniors and juniors, the former including those who are twenty-one or over, who have had charge of the work of others, or who have been juniors in regular standing for three years. Control is placed in the council, consisting of president, vice president, secretary, treasurer, and three members at large, whose duty it is to arrange programs for the meetings, publish and distribute necessary reports of the proceedings, and generally direct the affairs of the club.

It will be a distinct purpose of the club to associate in its membership those in the branch houses and local offices, as well as those connected with the plant at Hyde Park. A very successful future is anticipated for this new organization.

Removal.

The Philadelphia office of Richard Campion, selling agent for the Bristol Worsted Mills, Highland Worsted Mills and Loridan Worsted Co. is now at 300 Chestnut Street, Philadelphia, Mr. Campion having removed from his Bank Street office on the first of April.

The Diamond Drill and Machine Co.

The many friends of Mr. W. C. Johnston, so well known to the machinery trade, will be pleased to hear of his connection with the Diamond Drill & Machine Co., of Birdsboro, since the severance of his connection with Alexander Foster, of New York. Mr. Johnston will be a machinery salesman for the Diamond Drill & Machine Co., representing their Wagner cold saw, Jackson belt lacing machines, punches, shears, rolling mill machinery, open hearth steel castings, air furnace and cupola casting, etc.

"Byetting th' Engine."

A correspondent puts the following question:—"Can a person not get as many cuts off as he likes without being pointed out every time he goes along the street, and hearing folks say: 'Sithee, that's him ut gets so many cuts off at so-and-so's. That's him ut's byetting th' engine?' Besides, it's not nice." In reply I should say it depends by what means the cuts are got off. If overtime is worked to accomplish this end, then I have no sympathy with the correspondent. I mean if he works before the engine starts in a morning, works during mealtimes, and tries to put in a little extra time after the engine stops at night. However, if he gets the cuts out by sheer hard work and attention to duty, I should say that he has no right to be subjected to ridicule. Still, it all depends upon circumstances. Surely it is because he "beats the engine"—that is, putting in more time than the engine—that he has brought down upon himself the ridicule of his brother and sister weavers. It is an obnoxious practice, and leads to results which press upon weavers. If a good average is obtained by one weaver, no matter how it is secured, other weavers are pressed to reach it. All this leads to harassing conditions being enforced and driving practices put into operation. The correspondent has no right to take advantage of his colleagues by "byettin' th' engine." Therefore, let me advise him to stick to regulation hours, and work as hard as he likes in that time, giving faithful service to his employer.—Cotton Factory Times.

The United Telpherage Department.

The Dodge Coal Storage Co. has acquired the business of the United Telpherage Company of New York. Communications intended for the latter company should be addressed to The United Telpherage Department of The Dodge Coal Storage Company, 49 Dey St., New York.

The Murray Corliss Engine.

The "Revue Industrielle" of Paris in its issue of February 11th last devotes a page of descriptive matter and a double page supplement of drawings to the Murray Corliss engine that was exhibited at the St. Louis Fair by the Murray Iron Works Co. of Burlington, Ia.

Textile Education.

In a lecture at the Textile Department of Leeds University, M. Alfred Brigg, of Batley, referred to the proper training of a woolen manufacturer. He regarded it as of very great importance that a manufacturer should have a good general education previous to the commencement of his training, and the young man, on leaving school, should go into and be conversant with every department of the mill, and should learn the work in each comprehensively and thoroughly. He should be master of every process by the time he has gone through his apprenticeship. Instead of the textile college education being taken at the commencement, it should be taken on the completion of the apprenticeship, and in his opinion it should consist largely of theory or the laws and principles which were at the very foundation of the trade. It seemed to the lecturer an anomaly that the resources of a college or university should be taken up in teaching the elementary or practical processes of the trade. By the plan he suggested the students would be enabled to give more time to their theory and to the more highly technical knowledge which could alone be gained at a technical college.

Adulteration of Sumac.

A commercial paper published in Sicily calls attention to the systematic adulteration of sumac. Shipments of pure sumac are becoming the exception rather than the rule, and our contemporary gives some examples of the manner in which the shippers evade the regulations. The shipper of a consignment for Boston resorted to the following ruse to evade the law: One side of the bags was labeled "pure sumac," and on the other side, stenciled in water color, was "20 per cent. Lentisco." When the goods were put on the lighters the shipper's men proceeded to efface all signs of the "admixture band," thus leaving only the "warranted pure" band impressed in indelible color on the other side of the bag. This had been very artfully concealed from the notice of the Government official. By a steamer for New York was shipped 1,000 bags of sumac in one lot. It seems that the samples taken were not from the goods in course of shipment but from some bags lying on a car near at hand purporting to belong to the same lot. The sumac shipped was heavily adulterated, while only the goods lying on the car from which the samples were taken were pure. The Sicilian journal says that many such cases could be cited, and predicts that, if Sicilian shippers do not mend their ways, sumac will have to be kept at home to use as a fertilizer, and a trade worth a considerable sum annually will be lost to the country.—Dyer and Calico Printer.

The Orswell Mills, Fitchburg, Mass., have extended their system of humidifiers installed by the American Moistening Company, Boston, Mass.

A Resort Unequaled.

A most unique health and pleasure resort is Atlantic City. Favored by nature in a thousand ways and with the assistance of the energetic business man it has become the most popular and likewise the most frequently visited resort in America. The position geographically of Atlantic City is at the extreme southern part of the State of New Jersey and though directly on the ocean, its proximity to the Gulf Stream tempers the climate so perceptively that there is a very marked difference in temperature during the winter and in the summer months cool breezes are more frequent than at any other point on the coast. No other resort is reputed as is Atlantic City as an all year round resort and the season at Atlantic City at Easter time is most fashionable. The great hotels, and there are scores of them, are thronged with a gay assemblage and the Board Walk is a moving mass of happy tourists. No city pays greater attention to the care and entertainment of its guests than Atlantic City and every possible method of amusement is provided. The hotels are mammoth in proportions, elaborate in furnishings and nearly every one located adjacent to the Board Walk or Strand. The New Jersey Central was the pioneer road in making Atlantic City so accessible to New York and Northern territory through the introduction of its famous Atlantic City 3-hour flyers. These trains leave New York from station foot of Liberty Street at 9.40 a. m., 3.40 p. m. and 9.40 a. m. Sundays. The route traversed is the shortest and most direct. The trains are vestibuled and are drawn by hard coal burning engines and there is neither dust, cinders nor smoke. There are Pullman Buffet Cars on every train and for comfort and convenience the New Jersey Central's Atlantic City Express Service can't be equaled. If you want time tables and other information, drop a postal to C. M. Burt, G. P. A., New Jersey Central, New York City.

Recent Textile Patents.

BOBBIN HOLDER. 783,729. Thomas J. Murdock, Franklin, Mass., assignor to Murdock & Geb Co., Franklin, Mass.

CARD GRINDER. 783,565. Richard J. Aubuchont, Worcester, Mass.

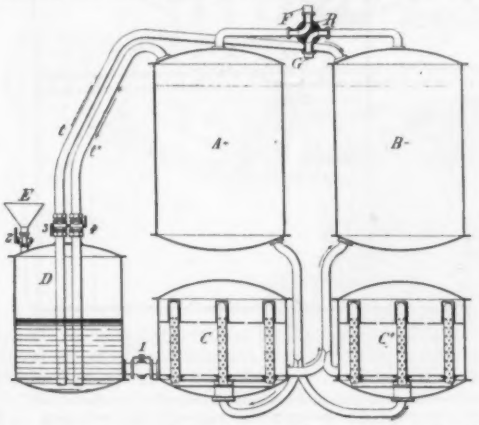
CLOTH CARRIER. 783,787. William H. Howard, Stoughton, Mass.

COTTON PICKER. 783,685. Benjamin F. Davis, Rocky, Oklahoma.

DYEING APPARATUS. 785,283. Daniel F. Waters, Philadelphia, Pa.

DYEING APPARATUS. 782,008. Leon Detre, Rheims, France.

This invention has for its object to provide in apparatus for dyeing under pressure means whereby the introduction of dyes or mordants into



the apparatus can be effected while the apparatus is at work and while the pressures remain in the various vessels composing the apparatus.

The most recent design of apparatus for dyeing under pressure is illustrated in the accompanying drawing and comprises two vessels, A and B, containing the dyestuff, and another vessel or other vessels, C C', containing the articles or material to be dyed. Compressed air or any other suitable fluid pressure is admitted alternately to each of the two vessels, A and B, containing the dye, so as to force the dye from, say, the vessel A into the vessel C, containing the articles or materials to be dyed, and from the said vessels into the second vessel, say the vessel B. Then by means of a cock the pressure is disconnected from the vessel A and admitted to the vessel B, thereby forcing the dye from the vessel B into the vessel C and therefrom back into the vessel A. The cock for reversing the direction of the pressure is a four-way cock R, which is worked automatically, so as to cause the air or other pressure to act alternately in each of the two vessels, A B, the other vessel communicating with the atmosphere.

DYEING MACHINE WARP. 785,597. Theodore E. Davis, Winston Salem, N. C.

ELASTIC FABRIC. Woven. 783,628. Henry J. Gaisman, New York, N. Y.

FABRIC CUTTING MACHINE. 784,086. James H. Vincent, Little Falls, N. Y.

FABRIC MARKING MACHINE. 784,089. Kate A. Werle, Nazareth, Pa.

LOOM. 784,370. Frederick E. Zengerl, Philadelphia, Pa.

LOOM. 783,578. Felix S. Hamel, Tamworth, England.

LOOM. Automatic Filling Replenishing. 783,695. Oscar Janelle, Manchester, N. H.

LOOM WARP Stop Motion. 775,452. John T. Meats, Taunton, Mass., assignor to Mason Machine Works, Taunton, Mass.

LOOM HARNESS STRAPS. Machine for Making. 784,148. John R. Fitton, Worcester, Mass.

LOOM. Jacquard. 785,679. Claude Novet, Zurich, Switzerland.

LOOM PATTERN Mechanism. 784,550. Randolph Crompton, Worcester, Mass., assignor to Crompton-Thayer Loom Works, Worcester, Mass.

LOOMS. Reversible Shifting Shuttle Box for. 783,424. Thomas F. Doyle, Manchester, N. H.

LOOM SHUTTLE GUARD. 785,359. Fritz Heintze, Greiz, Germany.

LOOM SHUTTLE. Hand Threading. 784,761. Charles E. Sackett, Fall River, Mass., assignor to Sackett-Marshall Shuttle Co., Fall River, Mass.

LOOM SHUTTLE Thread Tension Means. 783,538. Jonas Northrop, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM STOP Motion Detector. 784,188. Merrill O. Steere, Pawtucket, R. I.

LOOM SWEEP Sticks and Picker Sticks. Connector for. 784,195. Harry Walmsley and Joshua S. Ambler, Philadelphia, Pa.

LOOM TEMPLE. 784,930. William F. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM TERRY. 785,595. John H. Crowley, Charlotte, N. C.

LOOM WARP BEAM. 785,386. Albert J. Thornley, Pawtucket, R. I., assignor to Narragansett Machine Co.

LOOM FOR WEAVING Narrow Fabrics. 785,625. Charles H. Maxsted, Oakland, England.

LOOM FOR WEAVING Pile-Fabrics. 783,818. Arthur Buckler, Philadelphia, Pa.

PICK FINDER Mechanism. 785,575. Eppa H. Ryon, Worcester, Mass., assignor to Crompton & Knowles Loom Works.

SPINDLE. 784,414. George B. McCracken, Willimantic, Conn.

SPINDLE BOBBIN Clutching Means. Rotatable. George O. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

SPINDLE BOBBIN Clutching Means Rotatable. 783,664. William E. Allen, Salem, Mass., assignor to Sawyer Spindle Co.

SPINDLE BOBBIN Clutching Means. Rotatable. George W. Knight and Peter E. McCullough, Hopedale, Mass., assignors to Sawyer Spindle Co.

SPINDLE BOBBIN Retaining Means. Rotatable. 784,397. Andrew D. Morse, Hopedale, Mass., assignor to Sawyer Spindle Co.

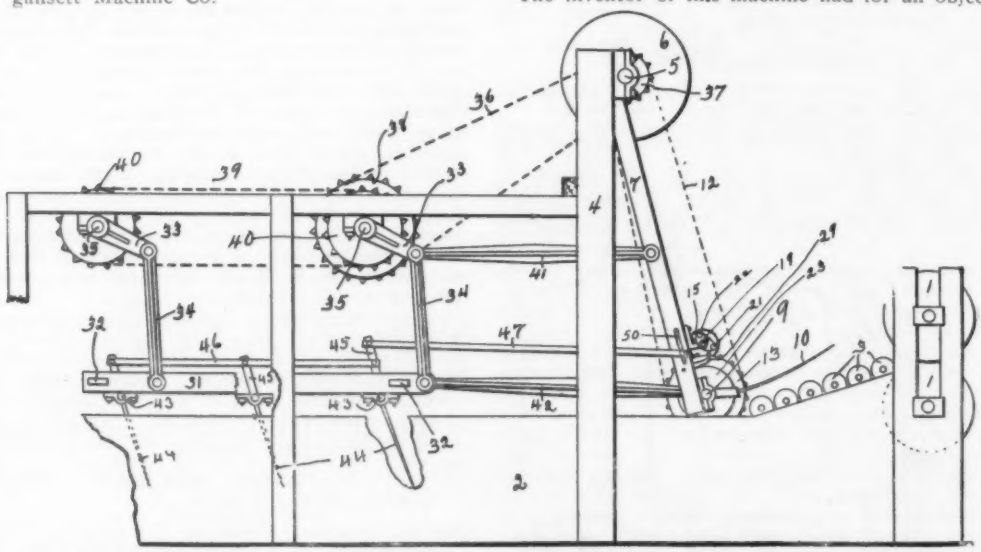
SPINNING MULE Attachment. 785,470. John Bond and Levi H. Bond, Waterloo, N. Y.

SPINNING RING. 783,681. James R. Coe, Ansonia, Conn.

WARP BEAM Let Off Rims. Guard for. 783,841. John W. Killpatrick and Charles F. Taplin, Lowell, Mass.

WOOL WASHING Machine. 784,240. Joseph H. Tillinghast, Stockton, Cal.

The inventor of this machine had for an object to build a more cheaply-constructed machine which will thoroughly agitate the wool while in the washing tub or vat, convey the same to the end of the tub or vat, and then elevate it to a conveyer, which deposits it into the squeeze or wringer rolls regularly by mechanical means automatically. His principal object was to reduce the wearing parts to a minimum, so as to require less power to operate the machine and also prolong its life



LOOM WARP Guiding Means. 784,310. Clare H. Draper, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Stop Motion. 784,920. Charles H. Chase, Hopedale, Mass., assignor to Draper Co., Hopedale, Mass.

LOOM WARP Stop Motion. 784,339. Joseph E. Lemyre, Manchester, N. H.

C. E. RILEY & CO.

65 Franklin Street, .. BOSTON, MASS.

BUILDERS AND IMPORTERS OF

COTTON WOOLEN WORSTED

MACHINERY

DIRECT .. .. IMPORTERS OF **EGYPTIAN COTTON**

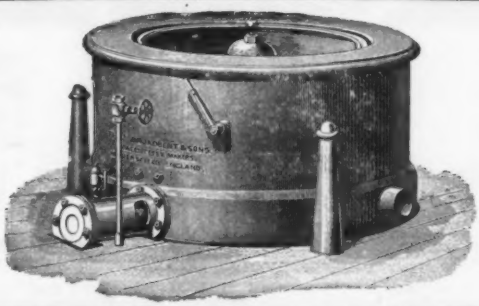
Thomas Broadbent & Sons,

Huddersfield, Eng.

PATENT DIRECT STEAM DRIVEN

HYDRO-EXTRACTORS

OVER 3500 IN USE. ALSO ELECTRICALLY DRIVEN



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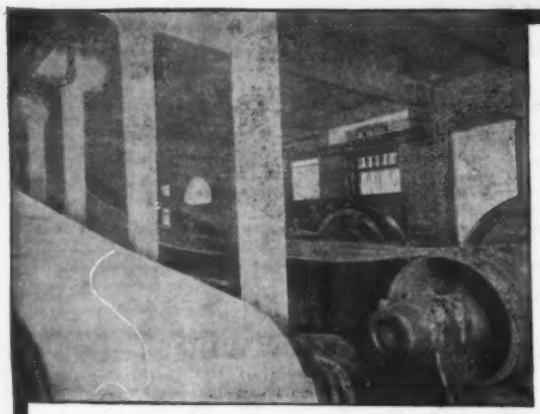
C. E. RILEY & CO., Sole Agents 65 Franklin St., Boston, Mass.

Machines Kept in Stock in Boston



JAMESTOWN, N. Y., Oct. 27, 1904.

CLING-SURFACE CO., Buffalo, N. Y.

GENTLEMEN:—The data herewith explains the conditions of the belts you have photographs of.

Our engine is 1000 H. P. The belts run from two 20 ft. pulleys (62 R. P. M.) to two 31" pulleys (450 R. P. M.) The large belt is 40" face, double leather, on 45 ft. centers. The shorter belt is 40" face, also double leather and on 35 ft. centers. The two belts were doing 500 H. P. when photographed and could do much more.

I have used Cling Surface here for five years and am entirely satisfied with it. These belts are clean, not sticky, pliable and in fine condition and the larger is running with a sag of 4 ft., while the smaller is 22" slack. I believe in slack belts and Cling-Surface permits me to run them so.

Yours very truly,
W. H. COBB, Chief Engr.,
Broadhead Worsted Mills.

Five Years Use in the Broadhead Mills

These big belts are a good example of what Cling-Surface is doing. Don't think of Cling-Surface merely as a material for belts. It is that, but its far reaching results make it a means to a new method of belt management—the easy or slack method, and that means low friction load, economy of oil, babbit, belts, fuel, power, time and trouble.

Get a package therefore and test it—severely.

CLING-SURFACE CO 199-205 Virginia St Buffalo N Y

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170 Summer Street

NEW YORK
39 Cortlandt Street

PHILADELPHIA
The Bourse

LUNKENHEIMER

The "Alpha" is the original and simplest form of oil pump made and can only be attached in a vertical position. The "Universal" can be attached either in a vertical or horizontal position by transposing of plug and shank, which interchange. Both styles are easy to fill and constructed to satisfy. Made in four sizes holding ⅛, ½, 1 pint, 1 quart of oil. Specify *Lunkenheimer* and order from your dealer. Write for catalog.

The Lunkenheimer Company,
Largest Manufacturers of Engineering Specialties in the World,
CINCINNATI, O., U. S. A.
Branches: { New York, 26 Cortlandt St. / London, 35 Great Dover St.

GLASS BODY
OIL PUMPS

12

New York, 26 Cortlandt St. Philadelphia, 1428-32 Callowhill St. New Orleans, Tulane-Newcomb Bldg. London, 35 Great Dover St. Paris, 24 Boulevard Voltaire.

Buyers' Index.

The addresses of builders of mill machinery and dealers in mill supplies, whose names appear in the following classified index, may be found upon referring to their advertisement. The Alphabetical Index to advertisers follows this classified list. Buyers who are unable to find in these classified lists such machinery or supplies as they desire, are invited to communicate with the publishers, who can, in all probability, refer them to proper sources.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Accountants, Public.
Garry, Brown & Co.

Air Moistening System.
American Moistening Co.
Bell Pure Air & Cooling Co.
Schutte & Koerting Co.

Appraisals.
Audit & Appraisement Co. of America, The.

Architects and Mill Engineers.
Ballinger & Perrott.
Dean & Main.
Ferguson, John W.
Suck, Adolph.

Auditors.
Garry, Brown & Co.

Automatic Feeds for Cotton and Wool.
American Drying Machinery Co.
Harwood, Geo. S. & Son.
Kitson Machine Co.
Leigh, Evan A.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Schofield, Wm. Co.
Woonsocket Machine & Press Co.

Balling Machine.
North Chemsford Machine Co.
Torrance Mfg. Co.

Bandings.
——See under Yarns.

Baskets.
Burlington Basket Co.
Lane, W. T. & Bro.
Morris & Co.

Belting.
Houghton, E. F., Co.
Jeffrey Manufacturing Co.
Main Belting Co.
Shultz Belting Co.
——See also Mill Supplies.

Belt Dressing.
Cling Surface Mfg. Co.
Dixon, Jas., Crucible Co.
Houghton, E. F., Co.
Shultz Belting Co.
Stephenson Mfg. Co.

Belt Lacing Machines.
Diamond Drill & Machinery Co.

Bindings.
——See Tapes and Braids.

Bleaching Kiers.
Allen, William Sons Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Textile Finishing Machinery Co.

Bleaching Materials.
Bosson & Lane.
Roessler & Hasslacher Chemical Co.

Blowers and Blower Systems.
American Blower Co.
Barney Ventilating Fan Works.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Mass. Fan Co.
New York Blower Co.
Philadelphia Drying Machinery Co.
Schutte & Koerting Co.
Sturtevant, B. F., Co.
Schnitzler, Chas. H.

Bobbins, Spools, Shuttles, Etc.
Leigh, Evan A.
Tebbets, E. L. & Co.

Boiler Arches, "Steel Mixture."
McLeod & Henry.

Boiler Setting.
McLeod & Henry.

Boilers.
——See Steam Boilers.

Boxes, Cloth Boards, Etc.
Pearson, J. T.

Boxes (Paper).
——See Paper Boxes.

Braiding Machinery.
New England Butt Co.
Textile Machine Works.

Braids.
——See Tapes, Braids and Edgings.

Brass (Perforated).
——See under Perforated Metal.

Brushers.
——See Napping Machines.

Brushes.
Felton, S. A. & Son Co.
Mason Brush Works.

Burr Pickers.
Curtis & Marble Machine Co.
Sargent's, C. G., Sons.

Burlaps.
Stoddard, Haserick, Richards & Co.

Buttons.
International Button Co.

Calico Printers' Machinery and Supplies.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons Co.
Taunton, New Bedford, Copper Co.
Textile Finishing Mchry. Co.
——See also Dyeing, Bleaching, Machinery, etc.

Canvas Baskets.
Burlington Basket Co.
Lane, W. T. & Bro.
Morris & Co.

Carbonizing.
Riverdale Woolen Co.

Carbonizing Machinery.
American Drying Machinery Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.

Card Clothing.
Ashworth, Elijah.
Bowes, L. M., Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Card Feeds.
——See Automatic Feeds.

Card Grinding Machinery.
Entwistle, T. C., Co.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Carders' Tools.
Brown, W. H.

Carpet Machinery.
Altemus, Jacob K.
Curtis & Marble Machine Co.
Philadelphia Textile Machinery Co.

Castings.
Farrell Foundry and Machine Co.
Link Belt Engineering Co.
Lunkenheimer Co.
Schofield, Wm., Co.

Chain Blocks and Hoist.
Yale & Towne Mfg. Co.

Chemicals.
Grasselli Chemical Co.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.

Chemists.
Little & Walker.

Cling Surface.
Cling Surface Mfg. Co.

Clocks.
Pettes & Randall Co.

Cloth Boards.
Chaffee Bros.
Pearson, J. T.
Shryock, J. K.
Smyth, J. L. N. Paper Co.

Cloth Stretchers.
Arlington Mch. Wks. (Arthur Birch, prop.)
Leyland, Thomas & Co.
Textile Finishing Machinery Co.

Clutches.
American Tool & Machine Co.
Carlyle-Johnson Machine Co.
Hunter, James, Machine Co.
Klein, Chas. C.
Link Belt Engineering Co.
Reeves Pulley Co.

Combs (Wool and Cotton).
Hood, R. H.
Leigh, Evan A.
Philadelphia Textile Machinery Co.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Condensers.
Schutte & Koerting Co.

Conveyors, Pneumatic.
——See Blowers & Blower Systems.

Conveying Machinery and Chains.
Coburn Trolley Track Co.
Jeffrey Manufacturing Co.
Link Belt Engineering Co.

Cop Tubes.
——See Paper Tubes.

Copper (Perforated).
——See under Perforated Metal.

Copper Print Rollers.
Rome Metal Co.
Taunton, New Bedford, Copper Co.

Coppersmiths.
Badger, E. B. & Sons Co.

Copper Work for Dyers.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Cotton.
Blaisdell, S., Jr., Co.
Charles, W. B.
Riley, C. E. & Co.
Stoddard, Haserick, Richards Co.

Cotton Elevators.
Buffalo Forge Co.

Cotton Machinery.
Altemus, Jacob K.
Atherton, A. T., Machine Co.
American Drying Machinery Co.
Ashworth, Elijah.
Baker Machine Co.
Barber & Coleman Co.
Barker, James.
Butterworth, H. W. & Sons Co.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Cohoes Foundry & Machine Co.
Coldwell-Gildard Co.
Curtis & Marble Machine Co.
Draper Company.
Easton-Burnham Co.
Elliott & Hall.
Entwistle, T. C., Co.
Firth, William, Co.
Houghton, L. T.
Howard & Bullough American Mach. Co.
Kilburn, Lincoln & Co.
Kitson Machine Co.

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Lowell Machine Shop.
Mason Machine Works.
Metallic Drawing Roll Co., The.
Neverslip Cop Spindle Co.
North Chelmsford Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Providence Machine Co.
Riley, C. E. & Co.
Saco & Pettee Machine Shops.
Schaellibaum, Robert, Company.
Schofield, Geo. L.
Stoddard, Haserick, Richards & Co.
Textile Appliances, Ltd.
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Whitin Machine Works.
Woonsocket Machine & Press Co.

Cotton Openers and Lappers.
Atherton, A. T., Machine Co.
Howard & Bullough American Mach. Co.
Kitson Machine Co.
Leigh, Evan A.
Riley, C. E. & Co.
Stoddard, Haserick, Richards & Co.

Cotton Softeners.
Bosson & Lane.
Warren Soap Mfg. Co.

Cotton Waste.
Blaisdell, S., Jr., Co.
Charles, W. B.
Greaves, Frank B.

Crayons.
Dixon, Jos., Crucible Co.
Lowell Crayon Co.

Cutter for Knit Goods.
Eastman Machine Co.
Langston, Samuel M.

Cutting Machinery.
Eastman Machine Co.

Dextrine.
Stein, Hirsh & Co.

Dobbies.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.

Drawing Rolls.
Hood, R. H.
Metallic Drawing Roll Co., The.

Dryers.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Boston Blower Co.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.
Mass. Fan Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sargent's, C. G., Sons.
Sturtevant, B. F., Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.
Vacuum Process Co.

Drying Boards.
Bull, William C.
Pearson, J. T.

Dusters.
—See Wool and Waste Dusters.

Dust Collectors.
Allington & Curtis Mfg. Co.
Philadelphia Drying Machinery Co.

Dyers, Bleachers and Finishers.
Brophy's, T., Sons.
Cranston Worsted Mills (Yarns).
Davidson, J. F.
Firth & Foster Co.
Greenwood, R. & Bault.
Home Bleach & Dye Works.
Ingrahamville Dye Works.
Lorimer's, The Wm. H. & Sons Co.
Maryland Bleach & Dye Works.
Molt Bros. (Indigo Blue).
Pawtucket Dyeing & Bleaching Co.
Providence Mills Mfg. Co.
Rowland, Samuel.

Dyeing, Drying, Bleaching and Finishing Machinery.
Allen, William, Sons Co.
American Blower Co.
American Drying Machinery Co.
Arlington Mch. Wks. (Arthur Birch, prop.)
Birch, Arthur, Arlington Mch. Wks.
Buffalo Forge Co.
Butterworth, H. W. & Sons Co.
Curtis & Marble Machine Co.
Entwistle, T. C., Co.
Fabric Measuring & Packaging Co.
Fearon, E., Co.
Fries, John W.
Gessner, David.
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Heusch, Severin.
Hopkins Machine Works.
Kenyon, D. R. & Son.
Klauder-Weldon Dyeing Machine Co.
Klipstein, A. & Co.
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Leyland, Thos. & Co.
Parks & Woolson Machine Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Rodney Hunt Machine Co.
Smith, Drum & Co.
Sturtevant, B. F., Co. (Drying).
Textile Finishing Machinery Co.
Vacuum Dyeing Machine Co.
Vacuum Process Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Dye House Cans.
Hill, James, Mfg. Co.

Dye Sticks.
Bailey, Frank.
Haedrich, E. M.

Dye Tubs.
—See Tanks, Tubs and Vats.

Dye Tubs, Tanks and Vats.
Hopkins Machine Works.

Dyestuffs and Chemicals.
Atteaux, F. E. & Co.
Berlin Aniline Works.
Bischoff & Co.
Bosson & Lane.
Cassella Color Co.
Grasselli Chemical Co.
Kalle & Co.
Farbenfabriken of Elberfeld Co.
Ford, J. B., Co.
Geigy Aniline & Extract Co.
Geisenheimer & Co.
Johnson, Chas. A. & Co.
Klipstein, A. & Co.
Kuttroff, Pickhardt & Co.
Leyland, Thos. & Co.
Metz, H. A. & Co.
Molt Bros. (Indigo Blue).
Nicol, J. M. & J. S.
Roessler & Hasslacher Chemical Co.
Solvay Process Co.
Sykes, Walter F. & Co.
Thayer, Ed. M.
Villa, H. S.

Dynamos.
—See Electric Lighting.

Edgings.
—See Tapes, Braids and Edgings.

Electrical Construction.
Crocker, Wheeler & Co.
General Electric Co.
Mechanical Appliance Co.
National Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Cloth Cutter.
Eastman Machine Co.

Electric Fans.
American Blower Co.
Buffalo Forge Co.
Crocker, Wheeler & Co.
General Electric Co.
Mass. Fan Co.
Mechanical Appliance Co.
Philadelphia Drying Machinery Co.
Philadelphia Textile Machinery Co.
Sturtevant, B. F., Co.
Westinghouse Electric & Mfg. Co.

Electric Lamps.
Sturtevant, B. F., Company.

Electric Lighting.
General Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Electric Motors.
Crocker, Wheeler & Co.
General Electric Co.
Mechanical Appliance Co.
National Electric Co.
Sturtevant, B. F., Company.
Westinghouse Electric & Mfg. Co.

Elevators.
Cohoes Foundry & Machine Co.
Jeffrey Manufacturing Co.
Salem Elevator Works.

Employees' Time Recorders.
Pettes & Randall Co.

Engravers.
Smith Bros.

Exhaust Heads.
Sturtevant, B. F., Co.

Expert Accountants.
Garry, Brown & Co.

Fans—Exhaust and Ventilating.
—See Ventilating Apparatus.

Fans.
Green Fuel Economizer Co.

Feed Water Heaters.
Green Fuel Economizer Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Pumps.
Goulds Mfg. Co.
Murray Iron Works Co.
Scaife, W. B. & Sons.

Feed Water Purifiers.
Philadelphia Water Purification Co.

Feeds.
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Felt Hardeners.
Farrell Foundry and Machine Co.

Felting Machinery.
Farrell Foundry and Machine Co.

Filters.
Norwood Engineering Co.
Phila. Water Purification Co., The.
Scaife, W. B. & Sons.

Finishing Machinery.
—See Dyeing, Drying, Bleaching and Finishing.

Fire Box Blocks, "Steel Mixture."
McLeod & Henry Co.

Fire Brick.
Borgner, Cyrus, Co.
McLeod & Henry.

Fire Extinguishers.
Badger, E. B. & Sons Co.

Fire Hose.
Eureka Fire Hose Co.

Fire Hydrants.
Norwood Engineering Co.

Fire Proof Doors and Windows.
Badger, E. B. & Sons Co.

Flax, Tow, Hemp and Jute Machinery.
Fairbairn-Lawson-Combes-Barbour, Ltd.

Fluted Rolls.
Leigh, Evan A.
Hood, R. H.
Leigh, Evan A.
Riley, C. E. & Co.
Thurston, A. G. & Son.

Flyers.
Hopkins Machine Works.
Leigh, Evan A.

Forges.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Forwarders.
McKeon, John F.

Friction Clutches.
—See Clutches.

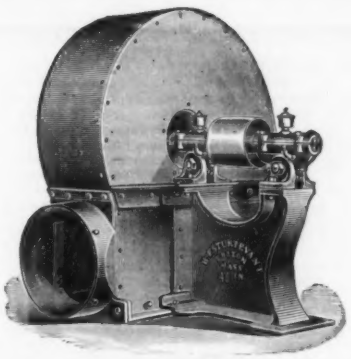
Friction Cones.
Evans, G. Frank.

Alphabetical Advertising Index, with page numbers, follows this list.

Waste and Dust

from Hoppers, Pickers, Shearers, &c., can be absolutely removed by the positive action of a

STURTEVANT EXHAUST FAN



Maintains clean work rooms and avoids the annoyance and great expense of dust chimneys.

B. F. STURTEVANT CO.

BOSTON, MASS.

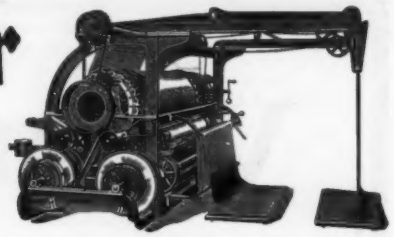
General Office and Works, Hyde Park, Mass.

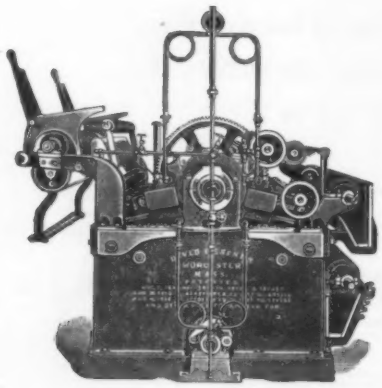
New York Chicago Philadelphia London

215

David Gessner

Worcester, Mass.

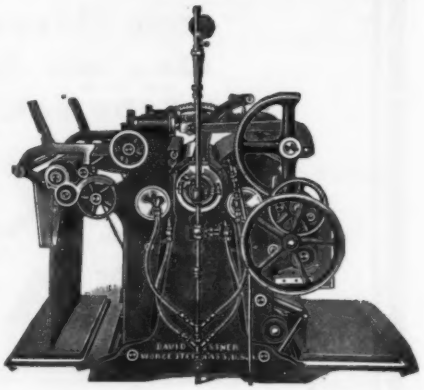




Latest Improved Cloth Finishing Machinery

—

Napping Machines and Presses a Specialty



Fuel Economizers.
Green Fuel Economizer Co.

Fulling Mills for Woolen Goods.
Hunt, Rodney, Machine Co.
Hopkins Machine Works.
Hunter, Jas., Machine Co.
Kenyon, D. R. & Son.

Garnetts.
Leigh, Evan A.
Philadelphia Textile Machinery Co.

Gas Engines.
Jones, Lewis.

Gas Exhausters.
Sturtevant, B. F., Co.

Gauges.
Crosby Steam Gage & Valve Co.
Lunkenheimer Co.
Walworth Manufacturing Co.

Gears.
Farrell Foundry and Machine Co.
New Process Raw Hide Co.

Gear Cutting.
Farrell Foundry and Machine Co.

Gear Cutting Machine.
Whiton, The D. E., Co.

Generating Sets.
Buffalo Forge Co.
Sturtevant, B. F., Co.

Grate Bars.
Tupper, W. W. & Co.

Grease.
Cook's, Adam, Son.

Grids for Cotton Openers.
Schaellibaum, Robert, Company.

Heating.
—See Ventilating.

Heddles.
Steel Heddle Mfg. Co.
Stoddard, Haserick, Richards & Co.

Hoisting Apparatus.
Coburn Trolley Track Co.
Yale & Towne Mfg. Co.

Hosiery Boards.
Pearson, J. T.

Hosiery Labels.
Beck, Charles Paper Co.
Kaumagraph Company.

Humidifying Apparatus.
American Air Moistening Co.
Bell Pure Air & Cooling Co.
Shutte & Koerting Co.

Hydro Extractors.
American Tool & Machine Co.
Riley, C. E. & Co.
Rodney Hunt Machine Co.
Stoddard, Haserick, Richards & Co.
Textile Finishing Machinery Co.
Whiteley, William, & Sons, Ltd.
Whittle, Jas. H.

Injectors.
Lunkenheimer Co.
Schutte & Koerting Co.

Ironing Machines for Knit Goods.
Craw, J. W., Laundry Machinery Co.

Iron Work.
Link Belt Engineering Co.

Jacquards.
Halton's, Thomas, Sons.

Knit Goods, Edgings, Trimmings, Etc.
Cathcart, John & Co.
Chapin, Geo. W.
Charles, W. B.
Cheney Bros.
Friedberger Mfg. Co.
Hepner & Horwitz.
International Button Co.
Krout & Fite Mfg. Co.
Weimar Bros.

Knit Goods, Finishing Machines, Crochet, Etc.
Craw, J. W., Laundry Machinery Co.
Eastman Machine Co.
Langston, Samuel M.
Merrow Machine Co., The.
Nye & Tredick Co.
Rodney Hunt Machine Co.
Scott & Williams.
Union Special Machine Co.
Wilcox & Gibbs Sewing Machine Co.

Knitting Machine Cylinders.
Branson Machine Co.
Paxton & O'Neill.
Stafford & Holt.

Knitting Machinery.
Boss Knitting Machine Co.
Branson Machine Co.
Brinton, H. & Co.
Claes & Flentje.
Cooper, Chas.
Crane Mfg. Co.
Excelsior Knitting Machine Mfg. Co.
Grosser Knitting Machine Co.
Jenckes, E., Mfg. Co.
Jones, Lewis.
Lamb Knitting Mach. Mfg. Co.
Leighton Machine Co.
Mayo, Geo. D., Knitting Machine Co.
Mayo Knitting Machine & Needle Co.
McMichael, A.
National Automatic Knitter Co.
Nye & Tredick Co.
Paxton & O'Neill.
Quaker City Stop Motion Co.
Richter, Wolfgang.
Ruth Machine Co.
Scott & Williams.
Stafford & Holt.
Standard Machine Co.
Taylor, James.
Tompkins Bros.
Walter & Co.
Walther, Otto.
Wildman Mfg. Co.

Knitting Needles and Supplies.
Branson Machine Co.
Breedon's, Wm., Son.
Brinton, H. & Co.
Cooper, Chas.
Corey, Wm., Co.
Crane Mfg. Co.
Dodge Needle Co.
Excelsior Needle Co.

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Ives, Loyal T.
Kolb, Frank E.
Lamb Knitting Machine Mfg. Co.
Manufacturers' Supplies Co.
Mayo Knitting Machine & Needle Co.
Page Needle Co.
Treat, Orion.
Wardwell Needle Co.

Labeling Machines.
Beck, Chas., Paper Co., Ltd.

Lamps, Incandescent.
General Electric Co.
Sawyer-Mann Electric Co.
Westinghouse Electric & Mfg. Co.

Lathes.
McCabe, J. J.

Leather.
Bowes, L. M., Co.
Houghton, E. F., Co.

Loom Pickers.
Garland Mfg. Co.

Looms.
Crompton & Knowles Loom Works.
Crompton-Thayer Loom Co.
Draper Company.
Kilburn, Lincoln & Co.
Leigh, Evan A.
Lowell Machine Shop.
Mason Machine Works.
Stoddard, Haserick, Richards & Co.
Whitin Machine Works.

Loopers.
Hepworth, John W. & Co.
Leighton Machine Co.

Lubricators.
Cook's, Adam, Son.
Borne, Scrymser Co.
Dixon, Jos., Crucible Co.
Lunkenheimer Co.

Lug Straps.
Bond, Chas.

Lumpers.
Gerry, George & Son.
Schofield, Wm., Co.

Machinery Dealers.
Fearon, E., Co.
Jefferson, Ed. & Bro.
Lamb, J. K., Textile Mach. Co.
Schofield, Geo. L.
Stead, Arthur.
Taylor, James.

Machinists' Tools.
Curtis & Marble Machine Co.
McCabe, J. J.
Whitin, The D. E. Co.

Mails.
Walder, J.

Measuring and Folding Machines.
Elliott & Hall.
Fabric Measuring & Packaging Co.

Mechanical Draft.
American Blower Co.
Boston Blower Co.
Buffalo Forge Co.
Green Fuel Economizer Co.
Massachusetts Fan Co.
Sturtevant, B. F., Co.

Mechanical Engineers.
American Blower Co.
Buffalo Forge Co.
Dean & Main.
Murray Iron Works Co.
Philadelphia Drying Machinery Co.
Sturtevant, B. F., Co.
Suck, Adolph.

Mercerizers.
Greenwood & Bault, R.
Home Bleach & Dye Works.
Lorrimer, Wm. H., Sons Co.

Mercerizing Machinery.
Arlington Mch. Wks. (Arthur Birch, prop.)
Butterworth, H. W. & Sons.
Klauder-Weldon Dyeing Machine Co.
Smith, Drum & Co.
Textile Finishing Machinery Co.
Whiteley, William & Sons, Ltd.

Metallic Fire-proof Window Frames and Sashes.
Badger, E. B. & Sons Co.

Mill Architects.
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Mill Brushes.
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Mill Builders and Engineers.
Ferguson, John W.

Mill Sewing Machines.
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Mill Supplies.
American Supply Co.
Bamford & Smith.
Barker, James.
Bond, Chas.
Buckley's, Benj., Son, Gun Mill.
Burlington Basket Co.
Crosby Steam Gage and Valve Co.
Easton-Burnham Co.
Eureka Fire Hose Co.
Garland Mfg. Co.
Houghton, E. F., Co.
Jefferson, Ed. & Bro.
Jeffrey Manufacturing Co.
Lane, W. T. & Bro.
Leigh, Evan A.
Main Belting Co.
Morris & Co.
Murphy, E. W. & Co.
Philadelphia Drying Machinery Co.
Riley, C. E. & Co.
Richardson Bros.
Shaw, Victor, Ring Traveler Co.
Stephenson Mfg. Co.

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Thurston, A. G. & Son.
Tucker, W. W. & C. F.
United States Supply Co.
Ward & Vandegrift.
Walworth Manufacturing Co.

Motors.
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American Napping Machine Co.
Curtis & Marble Machine Co.
Cessner, David.
Jones, Lewis.
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Parks & Woolsen Machinery Co.
Whiteley, William & Sons, Ltd.

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Malcolm Mills Co.
Ryle, Wm. & Co.

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Lunkenheimer Co.
Tucker, W. & C. F.
Walworth Manufacturing Co.

Oils.
Borne, Scrymser Co.
Cook's, Adam, Son.
Excelsior Wool Compound Co.
Murphy, E. W. & Co.
New York & New Jersey Lubricant Co.
Stephenson Mfg. Co.

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Tucker, W. W. & C. F.

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Coburn Trolley Track Co.
Cohoes Foundry & Machine Co.

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American Overedging & Seaming Machine Co.
Merrow Machine Co.
Willcox & Gibbs Sewing Machine Co.

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Johnson, C. A. & Co.

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Richardson Bros.
Smyth, J. L. N. Paper Co.

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Shryock, J. K.
Smyth, J. L. N. Paper Co.

Paper Box Machinery.
Beck, Chas., Paper Co., Ltd.
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Crosby & Gregory.
Howson & Howson.

Perforated Metals.
Hopkins Machine Works.

Peroxide of Sodium.
Roessler & Hasslacher Chemical Co.

Pipes and Fittings.
Pancoast, Henry B. & Co.
Walworth Manufacturing Co.

Pneumatic Conveying.
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Power Transmission Machinery.
American Drying Machinery Co.
American Mfg. Co.
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Carlyle-Johnson Machine Co.
Cohoes Foundry & Machine Co.
Columbian Rope Co.
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Farrell Foundry and Machine Co.
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Hunter, Jas., Machine Co.
Jeffrey Manufacturing Co.
Kilburn, Lincoln & Co.
Klein, Chas. C.
Link Belt Engineering Co.
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Reeves Pulley Co.
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Saginaw Manufacturing Co.
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Textile Finishing Machinery Co.

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Howard & Bullough Am. Machine Co.
Kitson Machine Co.
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Hart, Charles.
Miller Press & Machine Co.
Murray Iron Works.
North Chelmsford Machine Co.
Spence & Rideout.
Textile Finishing Machinery Co.
Woonsocket Machine & Press Co.

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Baker Machine Co.

Pressure Regulators.
Crosby Steam Gage & Valve Co.
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Textile Finishing Machinery Co.

Pump Governors.
Crosby Steam Gage & Valve Co.
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Norwood Engineering Co.
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North Chelmsford Machine Co.

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Crosby Steam Gage & Valve Co.
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Mason Regulator Co.
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Hill, James, Mfg. Co.

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Scallop Machines.
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New Bedford Textile School.
Philadelphia Textile School.

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Smith, Drum & Co.
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Nicol, J. M. & J. S.
O. K. Soap Co.
Stein, Hirsch & Co.

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Lowell Machine Shop.
Riley, C. E. & Co.

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Nicetown Mfg. Co.
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Bamford & Smith.

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Ward & Vandegrift.
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Lewis, H. F. & Co.
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American Blower Co.
American Drying Machinery Co.
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Buffalo Forge Co.
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Philadelphia Water Purification Co.

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Water Wheels.
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Wool Oiling Apparatus.
Harwood, Geo. S., & Son.

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Riverdale Woolen Co.
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American Drying Machinery Co.
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Philadelphia Textile Machinery Co.
Riley, C. E., & Co.
Rodney Hunt Machine Co.
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Stoddard, Haserick, Richards & Co.

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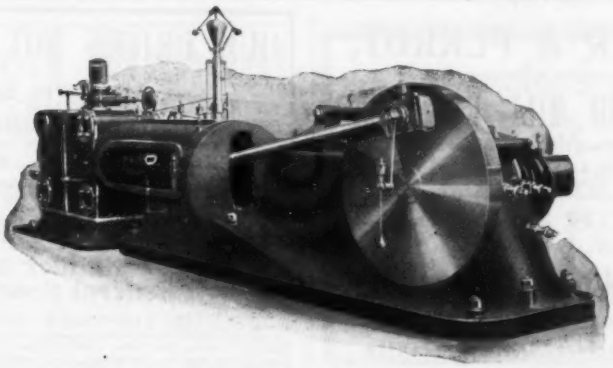

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12,000 CAPS, TUBES AND SPINDLES, ALL SIZES, WITH TENSION PULLEYS.

This machinery must be moved in order to make room for a large consignment now on the way.

170 Summer St., BOSTON. MASS.

MEN WANTED.

Same rates as Wants, For Sale, etc. Manufacturers will be furnished, without charge, with the names of suitable men who are entered on our list, and can usually supply their wants in this way.

Wanted: An Experienced Knitter to take full charge of department, flat, circular and rib, good manager of help, also foreman for finishing room. Reference required, state experience and wages expected. Address W. W. nowland, 10 Franklin Street, New York.

Knitter Wanted. One with a thorough knowledge of automatic machines for 180-needle or coarser goods. Automatic, Textile World Record.

Wanted at Once, fixer for National Spring Beard Needle Machines. Work in N. C.; large manufacturing town. "S," Textile World Record.

Wanted. First-class fast black cotton hosiery dyer. Address for full particulars, "Advertiser," Textile World Record.

Wanted. Overseer of Knitting Room for Hosiery Mill. Mill making 1,700 dozen seamless hosiery daily. Various gauges of men's, ladies' and ribbed goods, including fancies. Can give employment to overseer who thoroughly understands hosiery machinery and who can handle help. Mostly Standard machines; some Mayo's. Give references as to experience in handling help, knowledge of machinery and character. Address E. K. A., care Textile World Record, Boston.

Wanted. Secondhand in Finishing Room of Hosiery mill. Mill of 3,500 dozen capacity seamless hosiery. Can give employment to secondhand in finishing department. Must thoroughly understand getting out samples and be able to assist in handling portion of help. Work includes ladies' hose and ribbed goods in different grades and gauges, including fancies and some full-fashioned stock. State wages wanted, with references as to ability and character. C. D. E., Textile World Record.

A Good Position is always open for a competent man. His difficulty is to find it. We have openings for high-grade men in all capacities: executive, technical, clerical, paying from $1,000 to $10,000 a year. Write for plan and booklet. Hapgood's (Inc.), Suite 511, 309 Broadway, New York.

CORRESPONDENCE SOLICITED

with experienced Superintendent or Overseer. A small manufacturer, **outside the United States**, of circular ribbed underwear desires to improve his methods of manufacturing and learn through Correspondence the most up-to-date processes used in leading American Mills making Staple Cotton Goods. Fair remuneration will be paid for the desired information. Address "Correspondence," care of Textile World Record, Boston, Mass.

SITUATIONS WANTED.

The following advertisements are a portion of those of superintendents and overseers of whom full particulars are on file at this office. Manufacturers who may be in need of such men may address them in care of Textile World Record, or state their requirements directly, and the addresses of suitable men will be furnished without charge.

Any paid in-advance subscriber may have his name placed on the list of those desiring positions, upon filling out the requisite blanks, furnished upon request. Correspondence is confidential.

Mr. C. T. Donlevy, a practical mill overseer and superintendent, who has a wide acquaintance with mill men, is now a member of the Textile World Record staff, and gives special attent on to this department. He would be pleased to hear from any of his friends who may be interested.

COTTON SUPERINTENDENTS.

Superintendent or assistant of silk or cotton mill. Worked on plain and fancy ribbons and all classes of goods in broad silks, dress silks and tie silks, also Jacquard work. References. 3185, Textile World Record.

Superintendent or assistant superintendent cotton mill. Age 30; American, single. All kinds of cotton goods. Can take place at once. 3199 Textile World Record.

Superintendent of broad silk mill wants position. Age 39; English; married. Worked on mostly plain goods. Could be of good service to some reliable concern just starting up. Has small plant of his own which he would put in as stock with a first-class concern. 3154, Textile World Record.

Superintendent. Would like position in South. Not particular about salary to start. Machinist and thoroughly acquainted with all kinds of card room machinery, also spinning frames. Taken superintendent course in textile school and has had 23 years of practical experience in the mill, mostly on fine yarn work. 3044, Textile World Record.

Overseer of Cotton Carding. Age 32; married. Carded and combed yarn, fine and coarse, lenos, lawns, shirtings. English and American makes of machinery. References. 3025, Textile World Record.

Cotton Mill Superintendent, or assistant. Age 34, married. Worked on cotton machinery on coarse and medium numbers. Textile school education in designing, carding and spinning. 3003, Textile World Record.

Superintendent of cotton mill or overseer. Handled all kinds and numbers in yarn mills, cloth mills, colored warps, etc. Speeder, warper, spooler and spinner in the family. Age 48; American; married. 3219, Textile World Record, Boston, Mass.

Superintendent of Cotton Yarn Mill or duck mill. A young man; American; married. Prefers position in the South. Worked in different departments, spinning, spooling, twisting, warping, reeling and balling and now ready for a superintendent's place. Unquestionable references. 3087, Textile World Record.

Superintendent. All kinds of fancy cotton, white and colored, plain and fancy, jacquard and box work, also silks and worsteds. Would take good overseer of weaving position. 3120, Textile World Record.

Superintendent, or overseer of carding. Worked on combed and carded yarn from 20 up to 140, twilled sateens, lawns, sheetings and shirtings. English and American machinery. 3036, Textile World Record.

Asst. Superintendent or Overseer. 20 years' experience as overseer in both England and Scotland over combing, drawing, spinning, etc. Can work both long and short wools, get up all kinds of mixtures, instruct the shading of batches, etc. Has good references. 43 years of age. 3086, Textile World Record.

Wanted, position as superintendent of cotton cloth or yarn mill. American, 42 years old. 27 years' mill experience. Past six years as superintendent. Goods from 3 1/2 to 14 yards per pound. Recommendations from Massachusetts and Vermont mills. 214, Textile World Record.

WOOLEN SUPERINTENDENTS.

General Manager, agent, superintendent or designer. Worked on everything from fine worsted to a blanket. Good experience. Aged 37; American; married. 3172, Textile World Record.

Superintendent or Designer. Age 37; American; married. All grades of woolens and also cotton warp goods. Will not go South or to Canada. 3124, Textile World Record.

Asst. Agent, superintendent or mechanical engineer in woolen or carpet mill of any kind. Age 30; married. Excellent references. 3178, Textile World Record.

Manager, superintendent or designer. Age 30; English; married. Experienced in England and in this country. Mohairs, all classes of worsted suitings, plain and fancy dress goods. 3184, Textile World Record.

Superintendent or assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on union and satinets. Good references. Six years' experience in present place, five as overseer and one as superintendent. 3139, Textile World Record.

Superintendent or Designer. Age 37. English. Married. Experienced in this country and England. Worked on cloakings, suitings, coverts, broadcloths, etc. Mill closed, and wants place at once. Good references. 3140, Textile World Record.

Superintendent, manager or designer. Age 37; English; married. Worsted and woolen goods for men's wear and rain cloths. Worked in English mills, and has also been employed in this country. 3103, Textile World Record.

Superintendent, age 34; American; married. Worked on fancy woolens. Not employed and can take position at once. Will not go to Canada or West or South. Would take a good boss spinner place or assistant superintendent, but wants over $4.00 per day. 3104, Textile World Record

Superintendent of a woolen mill. Age 45; American; married. Been in last mill 12 years as superintendent. Out on account of mill closing. Can take position at once. First-class references. 3208, Textile World Record, Boston.

Superintendent of worsted yarn plant or overseer of drawing and spinning. Worked on Australian, English, domestic woolens, mohair, alpaca, spun from 8s to 70s, also carpet yarn. Age 38; American; widower. First-class references. 3221, Textile World Record, Boston.

Superintendent or boss weaver. 15 years' experience in worsted, woolen and silk goods. Graduate of Philadelphia Textile School. 32 years old; married. Good manager of help. American. 3119, Textile World Record.

Superintendent and designer, or assistant superintendent. Age 34; married. Worked on cloths ranging from all cotton to all wool and worsteds, such as cotton worsteds, jeans, army cloths, kerseys, etc. Excellent references. 3148, Textile World Record.

Superintendent and Designer. Age 30; American; married. Cotton warp, worsted and silk vestings, tapestry curtains, plaid backs, broadcloth, etc. 3146, Textile World Record.

Superintendent. Has made yarn and shoddies and about everything in woolen line. Good general knowledge of woolen manufacture. Familiar with English, Belgium and American carding, spinning and preparatory machinery. 3088, Textile World Record.

COTTON CARDERS.

Carder in Cotton Mill. Coarse or fine, white or colored, hosiery, Egyptian, etc. Age 35; Canadian; married. 3029, Textile World Record.

Overseer of Carding. Large experience on all kinds of work and both English and American systems. Can furnish first-class references. Had charge of carding in some of the best New England mills. 3009, Textile World Record.

Overseer of Carding or cotton ring spinning. Worked on carded and combed Peelers, Egyptian, and Sea Island cottons, making yarns from 8 to 80. 3015, Textile World Record.

Overseer of Carding. Has held all positions in picker and card rooms. White and colored goods, 5s to 40s. 3070, Textile World Record.

Overseer of Carding Mill. All kinds of fine yarns. Started up two of the largest card rooms in New England. Considered an expert in the manufacture of combed yarns from the bale to the finished article. First-class recommendations. 1745, Textile World Rcord.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. Will not go West or South. 3061, Textile World Record.

Overseer of Carding Department. Age 38; English; married. Plain and fancy goods; both combed and carded, Cotton Sea Island, Peruvian, Egyptian, Peeler, etc. Good references. 3196, Textile World Record.

Secondhand Carding or card grinding in a large mill. Worked on all white and colored goods, cotton from 4s to 70s. Good references. Age 29; German; unmarried. 3217, Textile World Record, Boston, Mass.

Overseer or secondhand in preparatory department of long chain beaming, quilling, tape dressing, warping and spooling. A Scotchman; married. Will not go West or South. 3156, Textile World Record.

Overseer of Cotton Carding. Worked on all classes of cotton, carded and combed, in counts to 135s. 3061, Textile World Record.

WOOLEN CARDERS.

Overseer of Combing, washing, carding. Age 36, English, married. All classes of wool. Good experience and first-class recommendation. 3094, Textile World Record.

Overseer of Woolen Carding. Would accept secondhand position. All wool, cotton and wool, shoddies, mixes, worsteds. Does not wish for position on shoddy, but would consider one. Blankets, suitings, flannels. Understands spinning. 3093, Textile World Record.

Carder and Spinner. Been overseer 32 years, making every variety of cassimere, flannels, overcoatings, cloakings, dress goods, etc. Married; American. 3132, Textile World Record.

Overseer of Carding. Age 30; American married; Nearly all classes of goods. Good experience and references. Address 3170, Textile World Record, Boston.

Secondhand in wool card room. Age 23; American. Wool and cotton mixes. References. 3198, Textile World Record.

Carder, or carder and spinner. Age 49; American. Has worked on all kinds of woolens, and of late on shoddy and cotton mixes. Is familiar with Davis & Furber machines. Excellent reference from past employer. 1944, Textile World Record.

Carder, or carder and spinner. German; married. Worked on all wool, wool and cotton, and shoddy mixes. Ten years' actual experience, and can furnish first-class recommendations. 2057, Textile World Record.

COTTON SPINNERS.

Overseer of Ring Spinning, spooling, long chain beaming, slashing and drawing-in. All kinds of fancies, sheetings, etc. $3.00 per day up. 3202 Textile World Record.

Overseer of Ring Spinning. Aged 42; American; married. Ginghams, sheetings, awnings, denims, etc.; $3 to $4 per day. 3018, Textile World Record.

Overseer of Cotton Mule Spinning. Understands Mason and English makes of mules. Has worked in mule room sixteen years, five years as second hand and a year and a half as overseer. 28 years old; married; steady and temperate. Would like to get work in N. E. or New York states. Has worked on colored hosiery yarn and filling. 1822, Textile World Record.

Overseer Ring Spinning, spooling and warping wishes a position. A married man, with good experience. Worked on sheetings, shirtings, jeans, grain bags. 3152, Textile World Record.

Supt. of Cotton Mill, or overseer of mule or ring spinning is open to a position; 16 years' experience in Northern mills, on yarns, denims, awnings, apron checks, bicycle suitings, shirtings, etc., etc. Familiar with all well-known makes of cotton machinery; 29 years old; American; married. Can give references from large Massachusetts mills. 1527, Textile World Record.

Overseer of Cone Winding and spooling or ring spinning, who understands Universal, Foster, Broadbent and Payne winders, and Whitin and Mason frames, desires a position. Has worked on carded and combed yarns from 4's to 160's; also, mercerized, gassed and bleached yarns from 2 to 8 ply. Young man; American; married, and can give satisfactory references from large mills. 1960, Textile World Record.

Overseer of Mule Spinning who has had a wide experience in large New England mills on yar ranging from 24's to 160's is open to a position. .. years old; American. Good references. 2003, Textile World Record.

Overseer of Spinning. Age 34; married. Good experience. 20s to 90s Egyptian and American cotton. 3125, Textile World Record.

WOOLEN SPINNERS.

Roll Coverer wants an opening for work. Can cover cotton or worsted rolls, make aprons, or better, has had large experience. Can furnish tools. Work by piece or day. 1803, Textile World Record.

Superintendent woolen mill. Age 47; English; married. Wants New England or Middle States. 10 years' experience in first-class N. E. mills. 2028, Textile World Record.

Overseer of Warping, Spooling and Winding. Dress goods and cloth. Will not go to Canada. Aged 40; married. Good experience. References. 3027, Textile World Record.

Woolen Finisher. First-class. Familiar with all classes of goods and machinery. Can take full charge from loom to case. Has always been very successful. 1244, Textile World Record.

Boss Spinner. Age 34; Scotch. Worked on all wool, cotton and wool and shoddy mixes. Will not go West, South or to Canada. References. Good experience. 3032, Textile World Record.

Overseer Woolen Spinning. Cassimeres, beavers, kerseys, dress goods, flannels, etc. Good experience. 3177, Textile World Record.

Boss Woolen Spinner. Would take a good secondhand job. Used to Davis & Furber and Johnson & Bassett machines. Worked on all kinds of goods. First-class references. 3215, Textile World Record, Boston.

COTTON WEAVERS.

Superintendent of cotton weaving and spinning mill. English. Quilts, damasks, brocades, ribbons, etc. 3175, Textile World Record.

Overseer of Weaving. Good experience and reference. Worked on lawns, sheetings, sateens, dimities, fancies, etc. 3188, Textile World Record.

Overseer Cotton Weaving. Plain and a variety of fancies, lenos, etc. Good experience. A young man; English; married. 3147, Textile World Record.

Overseer of plain cotton weaving. Age 27; American; married. Familiar with Whitin, Mason, Colvin and Draper looms. Worked on prints, sheetings, cambrics, lawns, twills, etc. 3143, Textile World Record.

Overseer of Weaving. Worked on sheetings, twills, sateens and fancies. Wants not less than $18 per week. 3157, Textile World Record.

Overseer of Weaving. Englishman; 33 years of age; married. Worked on fine lawns, sheetings, sateens and fancies, coarse drills, twills, bicycle cloth, automobile cloth for tires. Familiar with Whitin, Crompton, Knowles, Mason, Kilburn & Lincoln and Lowell machines. 3073, Textile World Record.

Overseer of Weaving or loom fixing. Worked on cotton, woolen, silk. Used to Crompton & Knowles looms, both box and plan, Lewiston looms, Mason, Colvin, Whiting, Patterson, etc. Age 43; Scotch; married. 3216, Textile World Record, Boston.

WOOLEN WEAVERS.

Overseer of Weaving, also designer. Men's wear, woolen and worsted, and fancies of all kinds, cotton worsteds, dress goods. Knowles and Crompton looms. Age 35. 3056, Textile World Record.

Boss Weaver or assistant superintendent. Worked on all kinds of worsteds and woolens. Crompton & Knowles looms. Wants place at once. Middle aged; English; married. Good experience. Excellent references. 3062, Textile World Record.

Boss Weaver. Aged 38; married. Cassimeres, beavers, kerseys, dress goods, flannels, blankets. Worked on Crompton & Knowles broad looms. Good recommendation. 3066, Textile World Record.

Overseer of Woolen Weaving, or would take a secondhand job. 35 years old; married. Familiar with Crompton & Knowles looms. Good references. 3089, Textile World Record.

Overseer of Weaving or designer. Age 29; American; married. Thibets, meltons, kerseys, worsteds and cotton worsteds. Crompton & Knowles looms. Good experience. First class recommendation. 2051, Textile World Record.

Boss Weaver, second hand or loom fixer. Age 30; married. Wants $3 per day. Men's wear, dress goods and all kinds of fancy worsteds. Crompton & Knowles looms. Reference. 3182, Textile World Record.

Boss Weaver and designer. All grades of fancy dress goods, woolen and worsted, cotton and cotton mix kerseys, coverts and venetians. Plain and fancy men's wear. 3181, Textile World Record.

Boss Weaver wants position. Very wide experience. White and colored, plain and fancy. Understands all kinds of looms. 335, Textile World Record.

Overseer of Weaving. Worked on all kinds of fancy dress goods, cotton, worsted and woolen, also men's wear. Age 31; English; unmarried. 3159, Textile World Record.

Overseer of Weaving, or weaving and designing in first-class mill wants position. Will not go South or to Canada. $4.00 per day. Can furnish excellent references. 3056, Textile World Record, Boston.

DYERS.

Wanted. Position by First-class Dyer. Fifteen years' experience on raw stock, wool, cotton, shoddy, cross dyes and all kinds of piece dyeing. Age 35 years. Temperate and good manager of help. First-class references. Address Box 28, Textile World Record, Boston.

Boss Dyer and bleacher. Scotch. Good experience and references. Underwear. 3195, Textile World Record.

Boss Dyer in a 3 to 5 set mill, or secondhand dyer, Raw stock and shoddy. Wants Mass., R. I., or Conn. 3187, Textile World Record.

Boss Dyer in woolen mill. Would consider a good second hand job. Worked on broadcloths, dress goods, raw stock. Won't go South or to Canada. 3180, Textile World Record.

Superintendent of cotton bleachery is open to a position. Excellent experience. American; married; aged 37. Familiar with cambrics, sheetings, shirtings, lawns, sateens, drilling and fancy weaves. 3153, Textile World Record.

Dyer on all grades of worsteds, kerseys, broadcloths, knit goods of all descriptions, alpacas, mohair lining, ladies' dress goods, worsted yarn, cotton yarn, wool and cotton raw stock. Age 41; English-American. 3214, Textile World Record, Boston.

Secondhand Dyer. Yarn and cotton pieces. Experienced on all classes of goods on a small scale. Age 23; unmarried. 3171, Textile World Record, Boston.

Overseer of Dyeing on all classes of worsted, woolen and union goods. Can take position on two weeks' notice. Age 26; American; single. First-class references. 3224, Textile World Record, Boston.

Secondhand in dyehouse. Would accept a position as salesman. Worked in first-class worsted and woolen mills. Age 26; American; unmarried. Can take place on short notice. 3211, Textile World Record, Boston.

FINISHERS.

Finisher and assistant superintendent wants position. Age 31; American; married. Good experience on all kinds of goods, especially on unions and satinets. Good references. Will not go West, South or to Canada. 3139, Textile World Record.

Boss Finisher. 25 years' experience on all classes of goods, woolen and worsted and cotton mixtures of all grades. 3142, Textile World Record.

Boss Finisher. American. Cheviots, cassimeres, beavers, dress goods, etc. Wants $2.50 to $3 per day. 3123, Textile World Record.

Boss Finisher. Mostly on fancy cassimeres and face finished goods. Familiar with most all makes of finishing machinery, in both dry and wet finishing. An expert in overhauling and fixing up old finishing machinery, and at setting up and starting new machinery. 3200, Textile World Record.

Overseer of Finishing Room. Cut and full fashioned balbriggan ribbed goods. Familiar with Union Special, Wheeler & Wilson, Willcox & Gibbs, Merrow, etc. Excellent references. Address 3168, Textile World Record, Boston.

Superintendent of bleaching and finishing cotton goods. Worked on all kinds of cheese cloth, buttercloth, sheetings, quilts, cambrics, long cloth, ducks and drills. Age 31; English; married. 3218, Textile World Record, Boston, Mass.

Overseer of Finishing. Worked on fancy worsteds, piece dyes and mercerized goods of all kinds. Worked on all kinds of finishing machinery. Age 25; English; unmarried. 3213, Textile World Record, Boston.

KNITTERS.

Foreman of Knitting Room. Age 29; American, unmarried. Fleece of all kinds and gauges. Balbriggan from 20 to 30 gauge. Flat work wool goods. Tompkin Bros. and Campbell & Clute machines. Will not go South. 3204, Textile World Record.

Secondhand knitter and fixer. Familiar with Lewis Jones, N. & T., S. & F., S. & W. and Brinton machines. Wants position at once. Ten years in present place. Ladies' and children's underwear and union suits. Will go anywhere. Age 28; unmarried. 3209, Textile World Record, Boston.

Superintendent of a knitting mill. Full fashioned seamless, worsted, merino, cotton, children's, misses' and ladies' hosiery and men's half hose. A fixer and one knitter and a looper in family. Age 41; German; married. First-class references. 3222, Textile World Record, Boston.

Knitting Foreman. Age 29; American; married. Worked on all kinds of ribbed underwear made on circular latch needle machines, all makes and gauges of latch needle machines, and slightly with Tompkins, Crane and Cooper latest spring needle rib machines. Can take place on week's notice. 3206, Textile World Record, Boston.

Foreman or assistant on spring needles. Worked on non-shrinkable woolen and worsted goods, fleece-lined, balbriggan and regular flat work. Used to Campbell & Clute and Tompkins machines. 30 years old; Irish and married. Can take position at once. 3205, Textile World Record, Boston, Mass.

Fixer, or assistant. Light and heavy weight. 20, 84, 126, 144, 160, 176 needle goods. Plated heel and toe. Plain goods. Worked on Mayo, Invincible, Victor, Ruth, McMichael & Wildman, knitting machines, Beattie and Hepworth loopers, 3/4 and 7/8 Excelsior. Age 21; German; single. 3220, Textile World Record, Boston.

DESIGNERS.

Designer on any class of dress goods, waistings, mantle cloths, fine shirtings, etc. 3203 Textile World Record.

Assistant Designer or asst. superintendent. Dress goods and men's wear. Age 25; Austrian; unmarried. Wants position in Philadelphia or suburbs. 3193, Textile World Record.

Designer on cotton, or assistant on woolen, worsted or Jacquard work. Age 31; American; unmarried. 3190, Textile World Record.

Designer in small mill or assistant in larger concern. Serges, cassimeres, shawls, and fancy worsteds and cotton goods. Wants only New England or Pennsylvania and New York. 3191 Textile World Record.

Designer. Age 29; American. Understands Jacquards and would like to get into a mill making ladies' dress goods, etc. 3186, Textile World Record.

Designer or superintendent. A German, 26 years of age. Dress goods and men's wear. Experienced in Germany and this country. 3163, Textile World Record.

Assistant Designer or assistant superintendent of woolen or worsted mill. A young man; American; unmarried. Men's wear, dress goods, silk brocades, damask, etc. 3160, Textile World Record.

Designer, woolen and cotton novelties. Used to fancy cassimere, ladies' dress goods, suitings and men's wear worsted, cotton and wool mixes. First-class references. Age 24; Scotch; single. 3212, Textile World Record, Boston.

Designer or boss weaver. Age 35; American; married. Worked on all kinds of worsteds, cheviots, men's wear, dress goods and coat linings. Used to Knowles and Crompton looms. First-class references. Can take position one week's notice. 3210 Textile World Record, Boston.

A Weaver's Advance

WHEN Wm. Easton, of Fitchburg, Mass., enrolled for the Textile Designing Course in the International Correspondence Schools, he was employed as a weaver in the Beoli Mill of the American Woolen Company. In a letter to the Schools he says: "As a result of your training, I have been able to secure a position as Assistant Designer in the same mill where I was employed as a weaver. Although at first skeptical, my experience with correspondence instruction, as conducted by the I. C. S., has convinced me that it is thorough and practical. Your Course is worthy of the consideration of any textile worker who desires to advance to a higher position in his craft."

By our method of training, by mail, thousands of ambitious textile workers have been able to advance in salary and position. You do not have to give up your present employment—we train you in your spare time.

We can help you qualify for a position as Superintendent; Designer; Boss Carder; Boss Spinner; Boss Weaver; Bookkeeper; Stenographer; Mechanical Draftsman; Ad Writer; Show-Card Writer; Etc.

Write, stating which subject interests you.

International Correspondence Schools

BOX 836, SCRANTON, PA.

MISCELLANEOUS.

Experienced Examiner for dyed and finished silks, silk and cotton, and also silk and woolen goods, wants position. Speaks and writer German, French and English. Good references. Address Examiner, care Textile World Record, Boston.

Overseer in winding, spooling and thread dressing. Age 34; Scotch; married. Also had some experience in beaming. Shoe and corset lacing, plain and fancy braids and tapes, fine ginghams and dress goods. 3192, Textile World Record.

Master Mechanic in cotton or woolen mill or cotton finishing plant. American; married. Good experience and reference. 3189, Textile World Record.

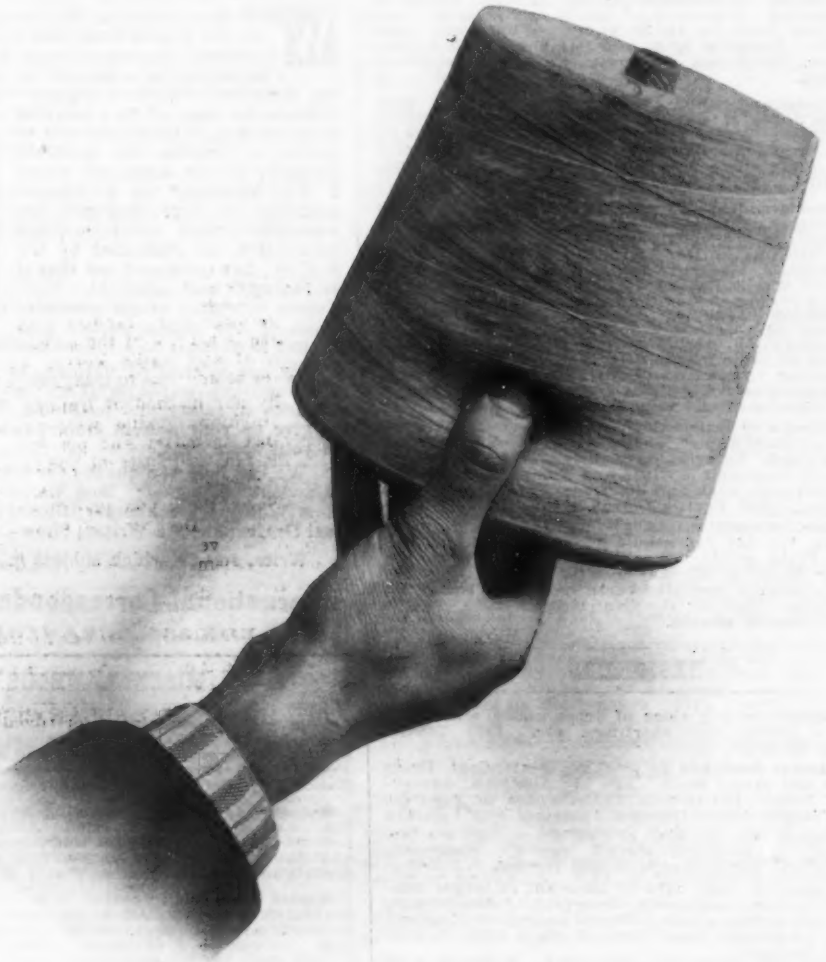
Salesman for shoddy or mill supply house, or machinery salesman. Familiar with all kinds of textile machinery. 3194, Textile World Record.

Second Boss or in advisory capacity for jacquard weaving. Familiar with almost every line of silk fabrics, also cotton backs, tapestry and upholstery goods, hammocks, table and bed covers, ribbons, etc. 3135, Textile World Record.

Loom Boss or asst. superintendent. All kinds of worsted goods for ladies' and gentlemen's wear and various classes of cotton goods. Worked in English mills and also in this country. 3151, Textile World Record.

Assistant Master Mechanic. Age 25; American; single. Used to all kinds of textile mill machinery. Can take position immediately. 3207, Textile World Record, Boston.

A Middle Aged Englishman, thoroughly understanding how to operate and fix jacquard and box looms, and prepare designs and pattern cards therefor, is open to accept a position this month. 3135, Textile World Record, Boston.



The Correct Cone for Knitting

No. 50 machine winds them soft with any degree of spacing, has lighter tension and pressure than any other winder, and by the saving in operating expenses pays for itself in a few months.

Universal Winding Company

95 SOUTH STREET, BOSTON

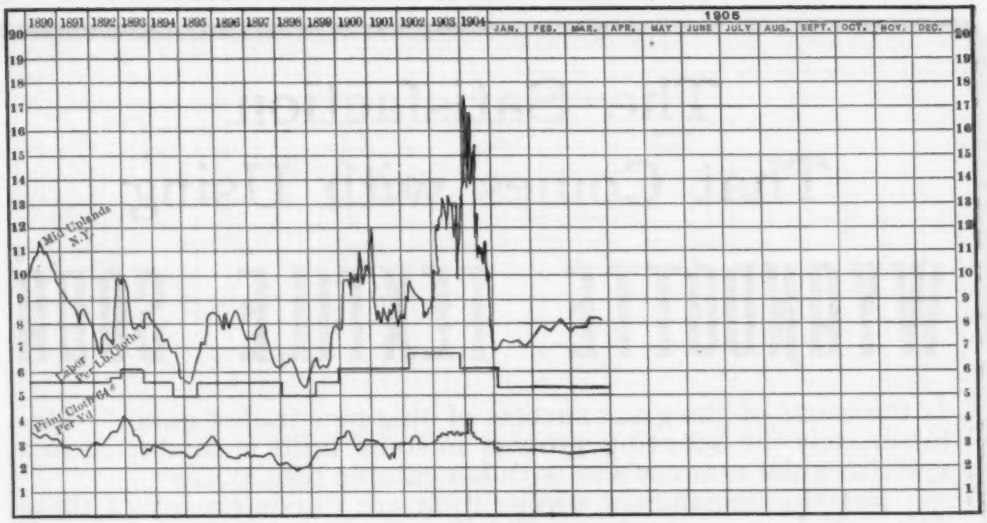

1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904
1905
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
Mid. Uplands N.Y.
Labor Per Lb. Cloth
Print Cloth 64 Per Yd.

CHART SHOWING RANGE IN THE PRICE OF COTTON TO DATE.

Cotton Market.

Cotton is being consumed at an unprecedented rate in every cotton manufacturing country. . Reports from abroad are to the effect that buyers in all parts of the world are eager to place contracts for goods at current rates, believing that no decline is possible, while an advance is probable. The ginners' report indicating a crop of 13,584,457 bales had but little effect on the market. The fact seems to be that the increase of 1,500,000 to 2,000,000 bales above the normal is more than counterbalanced by the deficiency of stocks both of raw cotton and manufactured goods.

The movement into sight since Sept. 1 exceeds that of any corresponding period on record, the figures as reported by the Chronicle for the past six seasons being as follows:

Movement into sight since Sept. 1:

1904-05	10,155,759 bales
1903-04	9,012,591 bales
1902-03	9,301,207 bales
1901-02	9,206,572 bales
1900-01	8,827,468 bales
1899-00	8,111,964 bales

The visible supply as estimated by the same authority also stands at a high mark, 4,271,435 bales; as compared with 3,283,839 bales at same date in 1904; 3,620,540 bales in 1903; and 4,184,233 bales in 1902.

The world's requirements are large; the supply is also large, and these are what make prosperity.

Yagi & Merrill,
Manufacturers' Agents.
General import and export business between
The UNITED STATES, JAPAN and CHINA.
Special attention given to COTTON FABRICS and to COTTON MILL MACHINERY.
OFFICES:
396-398 Broadway, New York City.
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C. M. BLAISDELL, Pres. and Treas. G. A. BLAISDELL, Vice-Pres. and Sec'y.
Established 1860—Incorporated 1893.
THE S. BLAISDELL, JR., CO.,
COTTON, EGYPTIAN PERUVIAN
American Long Staple a Specialty. Shipments direct to mill from Egypt, Peru and all American Southern Points.
CHICOPEE, MASS.
Cotton Waste Purchased on Yearly Contract from Mills.

WEIMAR BROS. MANUFACTURERS OF **Cotton Mercerized Tapes,**
SPOOL TAPES, BINDINGS AND NARROW FABRICS FOR UNDERWEAR AND OTHER TRADES.
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The Satisfaction That Comes with Using

WYANDOTTE TEXTILE SODA

Is the cause of the great success of this new trade "giant." Unfortunately the scouring process in some mills is conducted in a very irregular manner and with lamentable results.

But the demands of competition are causing many of these defects to be uncovered, and it is fast becoming a matter of common experience that the process of wool scouring as now generally employed injures the wool fiber as well as imperfectly removes the grease. To this latter fact is due the streaking in dyeing and other defects in the finished material.

That Wyandotte Textile Soda will remove these evils both in the scouring of wool and also in the finished cloth is beyond all possible doubt.

Wyandotte Textile Soda is scientifically prepared to do this special work, and the amount now consumed for this purpose proves how well it accomplishes the purpose for which it was designed.

If you are not thoroughly familiar with Wyandotte Textile Soda in a practical way and have never figured out how it is greatly to your interest to use this valuable material, write us and we will tell you, or have one of our practical demonstrators show you how it is proving a paying investment for those who do use it.

None Genuine except with a card bearing this Trade Mark

In Every Package.

This Soda was awarded the highest prize — Gold Medal — at the St. Louis Exposition.

The J. B. FORD CO.,

Sole Manufacturers,

WYANDOTTE, MICH.

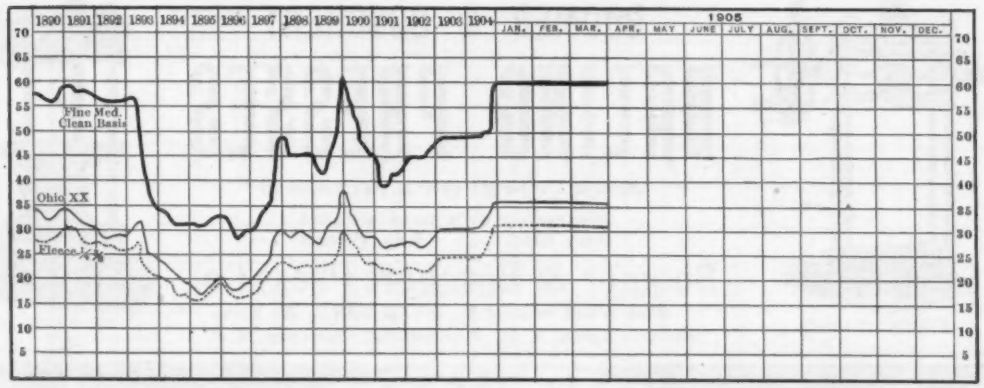


CHART SHOWING RANGES IN THE PRICE OF WOOL TO DATE.

Wool Market.

Since our last report the wool market has been quiet and the sales small because of the limited stocks offered in the seaboard markets, and in fact in all domestic markets. New wool is beginning to arrive and is reported to be in excellent condition and indicates that the shrinkage will be less than last year. Consumers of wool have been on the market and it is expected that the new clip will be quickly taken up. There is no disposition to lower prices as the domestic supply shows no material increase, while the foreign wool must necessarily command full prices owing to the import duty.

During last year it is believed that the consumption of wool by American mills has been the largest on record and that consequently the stocks of old wool are smaller than for many years. The dullness in the wool trade has given rise in some quarters to the fear of a decline. This feeling is not generally shared by the trade. The foreign market is strong and the statistical position here supports the prediction of continued high prices.

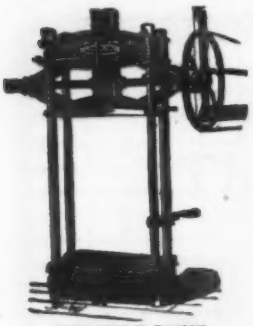
A rise in the price of wool is not likely to occur because prices are now above what is believed to be the purchasing power of the consumer. The consumption of cotton and shoddy is increasing and this will restrict the consumption of wool and prevent the increase in wool prices. Sales of carpet wool have been rather limited, but prices have been well sustained and we understand that contracts are being made for large importations in the near future. The market is between seasons and it will take a month or two for the situation fully to develop.

*Washington, Seattle. The Seattle Woolen Manufacturing Company, recently reported incorporated, has taken over the property of the Seattle Woolen Mill Co., with mill at Kirkland. They state that they expect to add a line of machines for manufacturing knit goods.

*South Carolina, Seneca. J. L. O. King, reported as interested in establishing a knitting mill, wants prices on knitting machinery, particulars as to capacity, etc., also quotations on cotton and woolen knitting yarns, and invite correspondence from any selling agent or jobber interested in handling a product. None of his equipment has been bought.

Wool and Woolen Goods Made **NONSHRINKABLE** by the use of "Nevershrink Process."
May be applied at any stage of manufacturing. Write for Booklet.
CHARLES H. HEYER,
1501 Real Estate Trust Bldg. Philadelphia, Pa.

STANDARD QUALITY COMBED RAMIE TOPS and NOILS a Specialty. RAMIE YARNS in All Numbers for All Purposes.
Wool, Mohair, Camel Hair, Silk, and Ramie Tops and Noils.
FRANK A. TIERNEY,
Wool, Tops, Noils, Yarns.
Woolen, Worsted, Mohair, Ramie and Silk Knitting Yarns.
All Kinds of Yarn for Weaving Purposes. Special Fibres and Novelties for Woolen, Cotton and Silk Manufacturers.
Room 203, Wool Exchange Building, 260 West Broadway, New York.



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Any Size .. Any Power

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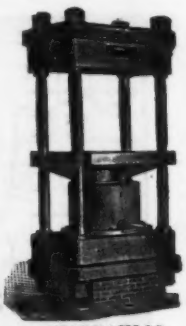
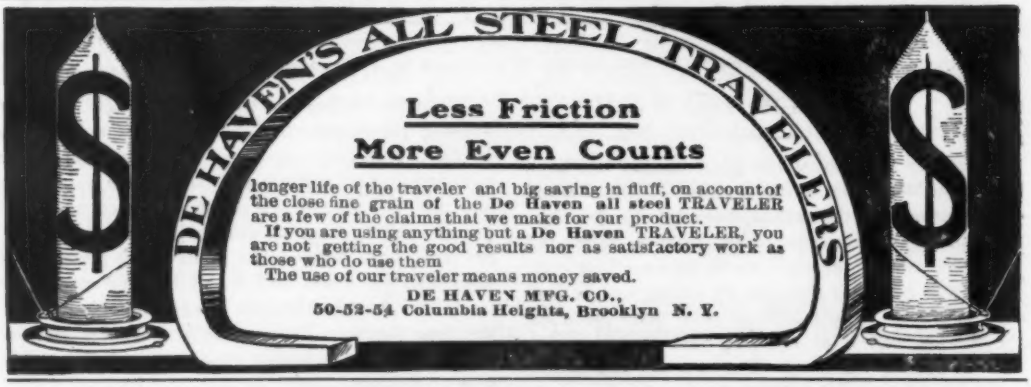


HYDRAULIC.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Less Friction
More Even Counts
longer life of the traveler and big saving in fluff, on account of the close fine grain of the De Haven all steel TRAVELER are a few of the claims that we make for our product.
If you are using anything but a De Haven TRAVELER, you are not getting the good results nor as satisfactory work as those who do use them
The use of our traveler means money saved.
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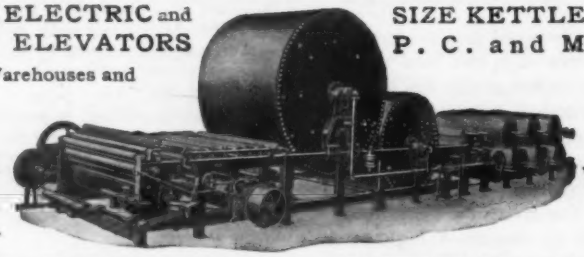
BELT-DRIVEN, ELECTRIC and HAND-POWER ELEVATORS

For Cotton Mills, Warehouses and Factories.

PULLEY BLOCKS.

OVERHEAD TRACKS.



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A Truthful Gage is the only GOOD GAGE.

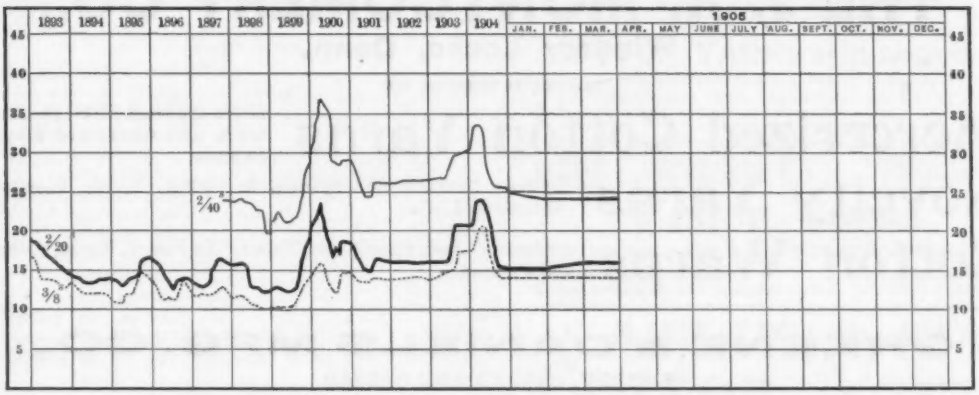
This Company manufactures, besides the above a large variety of articles used in connection with steam engines and boilers, all of which are standard quality, and may be relied upon. *Send for Catalogue.*

CROSBY STEAM GAGE & VALVE CO.

Stores: BOSTON, NEW YORK, CHICAGO, LONDON.

Office and Works: BOSTON, MASS.

Yarn Department.



GRAPHIC CHART SHOWING RANGE OF PRICE OF COTTON YARN TO DATE.

Eastern Yarn Market.

An improved condition prevails in the cotton yarn trade. The consumption of yarn is going on at a heavy rate and buyers are urging delivery on old orders. While there has been more or less hesitancy about closing new contracts, this has not prevented a large business from being booked. The strength of raw material and a general feeling of optimism in the goods market combine to place the yarn trade in a good position. Spinners are showing more independence than for a long time. Stocks are small and buyers have to count on the production of the spindles in placing orders. At the present cost of cotton, yarn prices do not give the spinner much more than a new dollar for an old one. The spinners claim that prices should be raised regardless of whether cotton advances or not, and they believe that any increase in the cost of raw material will be accompanied by a sharp advance in yarn. This opinion is shared to a certain extent by weavers and knitters, some of whom have recently made liberal contracts for future deliveries of yarn. There is some uneasiness regarding the uncertain stock of cotton held in the South, but on the other hand the consumption of cotton is going on at an unprecedented rate abroad. We quote as follows:

Eastern Cops.

6's	15
8's	15
10's	15¼
14's	16¼
16's	16¾
18's	17¼
20's	17¾
22's	18¼
24's	18¾
26's	19¼
30's	20¼
34's	21¼
36's	21¾
40's	22¾

On cones, ¼c. more up to 14's; 1c. more from 15's to 22's; 1½c. from 23's to 35's, and 2c. above that.

Eastern Two-Ply Skeins, Carded Peeler.

12's	17
14's	17½
18's	18½
20's	19½
24's	21
26's	22
30's	23
36's	24
40's	25
45's	29
50's	33
55's	37
60's	41

Eastern Two-Ply Warps, Carded Peeler.

2/30's	23
2/36's	24
2/40's	26
2/45's	30
2/50's	34
2/60's	42

Egyptian Weaving Yarns.
Single Skeins Combed.

30's	33
36's	35
40's	37
45's	39
50's	42
55's	45
60's	48
70's	57

Two and Three Ply Skeins, Combed.

30's	34
36's	38
40's	40
45's	42
50's	46

THE J. R. MONTGOMERY CO.,

Windsor Locks, Conn.

MANUFACTURERS OF

Mercerized Cotton Yarns Gives the High Silk-Like Lustre in Knit Goods and Woven Fabrics.

Novelty Yarns Boucle, Bourette and Spirals, in Cotton, Wool, Worsted, Mohair and Silk.

Cotton Warps on Beams, Jack Spools and Tubes. In Fancy, Twist, Colors and Printed.

GREENE & DANIELS MFG. CO.,

COMBED, CARDED AND GASSED

Yarns, Threads, Twines and Chain Warps,

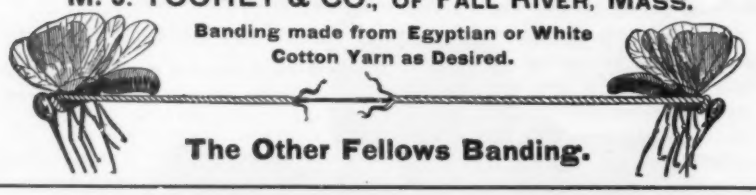
Colored and Bleached Yarns Furnished in any manner desired by the trade.

Pawtucket, R. I.

THESE MULES CANNOT BREAK THE BANDING —MADE BY—

M. J. TOOHEY & CO., OF FALL RIVER, MASS.

Banding made from Egyptian or White Cotton Yarn as Desired.



The Other Fellows Banding.

MONUMENT MILLS,

Manufacturers of

White, Colored, Fancy and Double Twist

HOUSATONIC, MASS.

COTTON WARPS

4s to 60s.

Dana Warp Mills

WESTBROOK, ... MAINE

White and Colored Warps 6s to 50s Single and Ply

Mule Cops From 30s to 50s from American & Egyptian Cotton

55's	49
60's	53
70's	63

Carpet Yarns.

60-yd. double reel filling	29
No. 2 60-yd. double reel filling	28½
1st quality ⅝	24
2d quality ⅝	23
60-yd. double reel filling skeins	10
(on cops)	11
120-yd. single reel cotton (on cops)	11
Wool ingrains, 42-yd. common	7
medium	8-8½
best	11½
extra best	15
light supers	18½
Super jute, 42 yard	7½
Super jute (light), 42 yard	7½-8
Velvet wool, spun, 135 yds., white	34
Gray	33

Philadelphia Yarn Market.

The yarn market is in good condition, as far as stocks on hand and orders for immediate delivery are concerned. Weaving yarn has been in very good demand and the market is bare of most numbers, especially of ply yarns. Prices on weaving yarns have been relatively higher than on knitting yarn the past few weeks. There has been considerable hesitancy on the part of buyers about placing large contracts ahead. Most buyers are afraid of the large amount of cotton that is still reported in the hands of farmers and this will probably have the effect of preventing extensive buying for future delivery, except the price on yarn should decline further, to a point that would make purchases safe.

Yarns today are selling on a very close basis, figuring on today's cotton, and there is no reason why the price should go lower, if the price of cotton can be maintained at 8c., which seems to be the limit for which holders of good cotton are standing. Most all classes of weavers are busy and most knitting mills are running full time, although some of the knitters report a scarcity of orders. Prices today are about as follows:

Southern frame spun cones:—

7's and Coarser	15
8's and 9's	15
10's	15-15½
12's	15½
14's	16
16's	16½
18's	17
20's	17½
22's	18
24's	18½
26's	19
30's	20
40's	25
50's	31

PAULSON, LINKROUM & CO.
Successors to BUCKINGHAM, PAULSON & CO.
Commission Merchants
COTTON YARNS of all Descriptions
83 Leonard St., NEW YORK
302 Chestnut St., Phila. 210 Munroe St., Chicago, Ill.
Cash Advances, Cash Sales and Prompt Returns. Consignments and correspondence solicited.

JAMES E. MITCHELL CO., COMMISSION MERCHANTS.
Cotton Yarns
FOR ALL PURPOSES.
122-124 Chestnut Street, PHILADELPHIA, PA.
Brown Building, 185 Summer Street, BOSTON, MASS.

CATLIN & CO.,
Cotton Yarns
345 Broadway, NEW YORK.
67 Chauncy Street, BOSTON.
206 Chestnut Street, PHILADELPHIA.
605 Medinah Temple, CHICAGO.

Harding, Whitman & Co.,
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COTTON AND WORSTED YARNS.
BOSTON. NEW YORK. PHILA.
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A. D. SALKELD & BRO.,
With FRED'K VIETOR & ACHELIS,
YARNS.
66-72 LEONARD STREET, - NEW YORK.

Fred Sternberg & Co.
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MERCERIZED TURKEY RED GASSED } COTTON YARNS.

E. D. LORIMER & CO.
COTTON YARNS } ALL NUMBERS
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346 BROADWAY, NEW YORK.

MOELLER & LITTAUER,
SILK, WORSTED, WOOLEN YARNS COTTON AND MOHAIR
Polished Threads and Tinsel. Artificial or Wood Silk.
Mercerized, Turkey-Red, Fine Gassed Yarns.
109 GREENE ST., NEW YORK

CAPACITY, 60,000 Spindles. **ORSWELL MILLS** FITCHBURG, MASS.

COMBED **COTTON YARNS** CARDED

In Chains and Skeins, on Balls, Beams, Spools—Single or Twisted.

THE MALCOLM MILLS CO.,

MANUFACTURERS OF

FANCY YARNS and POLISHED THREADS.

Offices: 229 Chestnut St., Philadelphia.

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KROUT & FITE MANUFACTURING CO.,

Manufacturers of

Silk, Cotton and Mercerized Narrow Fabrics

Spool Tapes a Specialty.

Telephone Connection. Office and Mill, Allegheny Ave. and Emerald St., PHILADELPIA.

WALCOTT & CAMPBELL SPINNING COMPANY

Fancy Hosiery Yarns

IN ALL COLORS

New York Mills, Oneida Co., New York.

A. G. THURSTON & SON,

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Fluted Rolls, Pressers for Flyers

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Specialties made of Renecking, Refluting, Filing and Honing of all kinds of Rolls. Flyers Repaired and Fitted with any desired style of Pressers, Spindles Straightened Restepped and Retopped.

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Cotton Warps and Yarns, in Gray and all Colors, Single or two or more Ply and Cable Cord.

Novelty Yarns, in Various Patterns, Colors and Twists.

Carded and Colored Cotton, For Mixing with wool, Machined or in Roving.

Indian Orchard, Mass.

E. MORGAN-PRES. H. R. WRIGHT-TREAS. W. C. GODFREY-AGT.

Southern high grade mule yarn:—

Cones.	
10's	16
12's	16½
14's	17
16's	17¼
18's	18¼
20's and 22's	18¾-19½
24's	20

Southern frame yarn, lower grades:—

6's and 8's	14½
10's	15

Eastern cones (high grade quality):—

10's	16½
12's	17
14's	17½
16's	18¼
18's	18¾
20's and 22's	19¼-19¾

Skein yarn (mostly Southern):—

4's to 8's soft	15
10's to 12's	15½
14's to 20's	15½-16½
22's	16½
14/2	16
16/2	16½
20/2	17
30/2	19
40/2	24
16/3 slack	16½
12/3 slack	16¼
8/3 carpet	15½
8/3 slack	15¼
9/4 slack	15-15½

Warps (Southern):—

10's to 12's	15½
14's	16
16's	16½
20's to 22's	16½-17
26's	18
14/2	16½
16/2	16¾
20/2	17-17½
24/2	18
30/2	19-19½
40/2	23½-24

Mixed colored yarns (mock twist, half colors):—

6's to 10's	16-16½
12's to 14's	17-17½
16's to 18's	19-19½

Silver and jaeger, 1½c. over white.

Mock Egyptian, 2c. advance over white.

Egyptian, 4c. to 5c. above best quality white.

Worsted Yarn.

Many spinners are looking for orders. The past season has been a disappointment to many of them as orders were booked for large quantities of yarn mostly bought on speculation. The yarn which was bought on the low edge of the advance enabled certain weavers to secure many orders by not advancing the price of cloth and these weavers have secured the fancy worsted business for the

O. K. SOAP CO.
MANUFACTURERS
FINE TEXTILE SOAPS,
SILKINE,
AND LISLE SILK FINISH
For Fast Black and Colors. Softness and lustre.
Write us to-day.
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LINEN YARN IMPORTER.
HUGHES FAWCETT, 115 Franklin Street, NEW YORK.
Flax, Hemp and Jute Line and Tow Yarns, For Weaving Purposes.
Linen Jacquard Harness Twines, Fine Cotton Harness and Heddle Twines, For Cotton, Silk, Woolen and Carpet Manufacturers.
Correspondence solicited. Samples promptly furnished.

Mercerized and Plain
Skein, Warps, Cones, Cops, Tubes
COTTON YARNS
426 and 428 Market St., Phila.
Theo. H. Strouse & Co.

Ballou Yarn Co.
PROVIDENCE, R. I.
Harness and Seine Twines and other Job Gassing, Winding, etc. All Numbers.
GASSED YARN SPECIALTIES

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COMBED and CARDED
COTTON YARNS
From Northern and Southern Mills.
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MANUFACTURER OF LILY BRAND NARROW FABRICS
RIBBONS, TAPES, BINDINGS & NON ELASTIC WEBBINGS
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Thomas Wolstenholme Sons & Co.,
MANFRS. OF
ALL NUMBERS
SINGLE AND TWO-PLY,
On Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural and Fancy Mixes.

Worsted
YARNS
Sell Direct,
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Pocasset Worsted Company,

WORSTED YARNS
IN THE GRAY.

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Worsted and Mohair Yarns—White or colors, in skeins, on spools, cones, or shuttle bobbins.

Novelty Yarns—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making yarns only.

Genapped Yarns of all kinds. Doup Yarns. Harness Yarns. For Braids, etc.

DYERS OF YARN AND SLUBBING. BRISTOL, R. I.

French System. Bradford System.

B. F. BOYER CO.,

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Eaton Rapids Woolen Mills,

EATON RAPIDS, MICH.

EDDY & STREET,

Cotton, Woolen,

Yarns and Braids

Worsted, Spun Silk.

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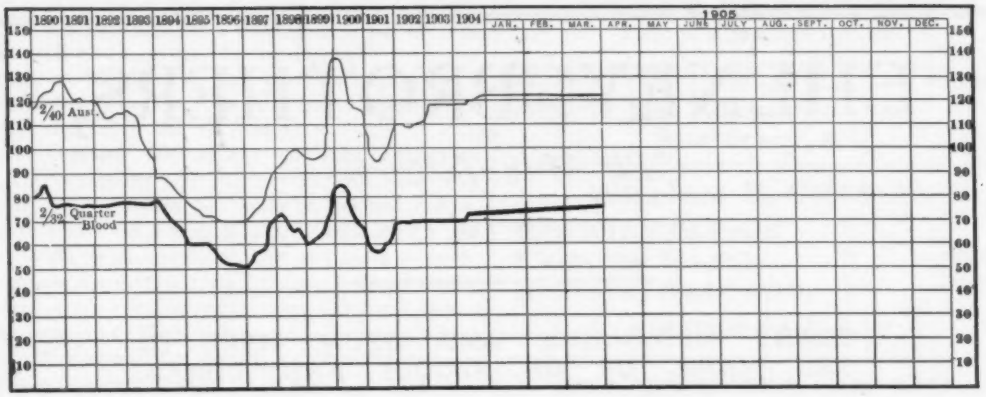


CHART SHOWING RANGES OF PRICE OF WORSTED YARNS.

season and have taken the yarn for which they contracted. There were many who bought after the advance had taken place; these weavers have failed to secure orders and in consequence have been unable to give spinning instructions. There are other spinners who today own wool on which they are paying interest without a remote chance of getting orders to spin it into yarn.

Some of the spinners who are delivering yarn on orders placed early in the season are doing so at a positive loss. Said one spinner to the user of his yarn: "We are going to give you every pound for which you have contracted, but we want you to know that we are delivering it at a loss to ourselves of 12 cents per pound." The reason of this loss probably has been that the spinner secured other orders at a higher price and had used the tops intended for the cheaper contract. Again many did not believe in the advance and sold short. We know of one spinner who is delivering yarn at 72 cents per pound when today the market price is 85 cents per pound.

Many of the weavers in trying to hold their trade and meet prices set by the cloth buyers, lowered the grade of their cloth and when deliveries began to go forward these orders were cancelled. Weavers have also been making their cloth light, 20-oz. cloth running from 17 to 18 ounces. Many buyers have cancelled their entire orders, hoping thereby to break the cloth market and after awhile buy at a much lower price. This class of trade is going to be disappointed for, while spinners would like to make lower prices, they cannot do so as long as the price of wool remains on its present level.

SILK NOILS AND SILK NOIL YARNS
In White and Colors.
A. T. SKERRY & CO., 47 Leonard Street, NEW YORK.

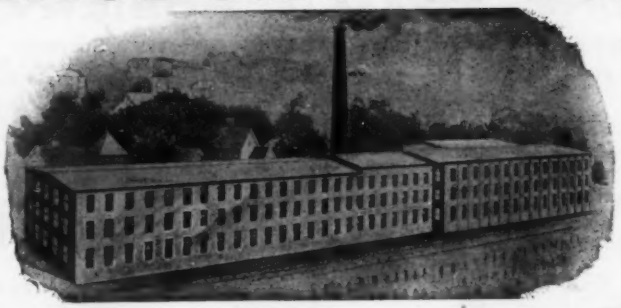
MOHAIR LOOPS, KNOTS AND FANCY YARNS FOR DRESS GOODS & CLOAKINGS.

QUEENSBURY MILLS WORCESTER MASS.

MOHAIR TOPS AND YARNS FOR WEAVING

LUSTRE YARNS FOR SERGE LININGS

ALPACA YARNS



SPINNERS OF MOHAIR YARNS FOR ZIBELINES

DRESS GOODS YARNS
KNITTING YARNS
WORSTED YARNS

MOHAIR

CHENEY BROTHERS,

Silk Manufacturers,

SOUTH MANCHESTER, CONNECTICUT.

TRAMS, ORGANZINE AND SPUN SILKS IN THE HANK, OR ON SPOOLS AND CONES.

SILKS FOR ELECTRICAL USES, INSULATION AND SPECIAL PURPOSES MADE TO ORDER.

KNITTING SILKS, RIBBONS AND PIECE GOODS FOR TRIMMING KNIT GOODS.

Pure Dye and Fast Colors Warranted.

WILLIAM RYLE & CO.,

Foreign and Domestic

Spun Silk Yarns and Noils.

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., NEW YORK.

SAUQUOIT SILK MFG. CO.,

INSULATING AND BRAIDING SILKS.

ORGANZINE, TRAM & HOSIERY SILKS.

Fast Dye Organzines for Woolen Manufacturers a Specialty.

Mills: Bethlehem, Pa., Phila., Pa., Scranton, Pa. New York Representatives, Wm. Ryle & Co., 54 Howard St.—Phila. Office, 4015 Clarissa St., Nicetown.—Chicago Office, 210 Monroe St.—Boston Office, 78 Chauncy St.

Crochet Lace Edgings

Spun Silk, Splicing Yarn, Mercerized Yarns, Cotton Warps, Sewing Threads, Tapes, Braids, Domets, Cambrics, Silesias. : : :

Write for Prices and Samples. **George W. Chapin** 229-231 Church St. PHILADELPHIA

There is no doubt that on 1/4 and 3/8 blood yarn prices are too high, but while this is so, the decline will not be great. So far as can be seen, the prices on this class of yarn are about 2 1/2 cents per pound lower, but on half blood quality and above the prices are no lower.

The business this season has been largely on cotton worsteds and mercerized worsteds, and these mills are running nights to get out orders. Some of this cloth is made of all cotton yarn, some has a percentage of 2/40 yarn and some is made of single yarn from 1/10s to 1/24s. Some of the spinners are running hard to get out these orders and spinners of French spun are selling much yarn for this purpose and getting most of the business on today's conditions.

The trend of the trade is to get off the 1/4 and 3/8 blood yarn and the weavers who have employed the better grades have had the fewest cancellations. The difference between half blood and quarter blood quality of yarn is comparatively slight and the manufacturer who improved the quality of his cloth and asked a slight increase, pleased a department of his trade and held his orders with a good run ahead of him. Some of the weavers lowered prices in an endeavor to secure late business, but as the bulk of the trade had purchased mercerized cloth, cotton worsteds or fancy worsteds at very low prices, this move brought no benefit. Some orders for yarn are being placed from time to time as the orders for cloth are secured, but comparatively few large contracts are placed. There is no doubt that many orders for cloth must be placed later as cloth buyers are trying to break the yarn market. All yarn purchased is for immediate delivery and buyers state they shall need yarn, but expect to buy later at lower prices.

Much rain cloth is being sold at this time and the dress goods manufacturers have had a good run on Panama cloth. The plain cloth having lost its hold on the public, manufacturers are now getting out fancy effects by using mercerized yarn and many new and taking styles are produced in this way. Dress goods manufacturers as a rule have not been busy except on Panama cloth. They are still using 1/4 to 3/8 blood yarn and complaining that the high price of yarn compels them to run at small profit to themselves. Bunting is slow at this season of the year as usual.

While trade is quiet the situation is not a hopeless one and conditions are healthy and point to a good business when once it gets under way. Yarn prices may ease off on 1/4 blood yarn, but not to any material amount.

We quote as follows:

2/40s Australian	$1.12
2/40s XX Delano	1.10
2/40s Half Blood	1.00
2/36s 3/8 Blood	.86
2/30s 1/4 Blood	.75

JENCKES SPINNING CO.,
Formerly E. JENCKES MFG. CO.
Carded and Combed Cotton Yarns for Weavers and Knitters.
Double and Twist Yarns for Woolen Trade.
PAWTUCKET, R. I.

WILLIAM B. CHARLES,
Cotton Yarns,
Cotton Cloth,
Silesia, Sateens,
For the Underwear Trade.
AMSTERDAM, N. Y.

GRANT YARN CO.,
COMBED AND CARDED COTTON.
YARNS 40's and above. AND WARPS
FITCHBURG, MASS.

FLOSSETTE MILLS
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New England Thread Co.
CENTRAL FALLS, - - R. I.
(DYERS and BLEACHERS) and MANUFACTURERS of
High Class Threads on Tubes, Spools and Cones and MERCERIZED YARNS for Knitting.
GLAZING OF YARNS
For the Shoe Lace. TAPE and WEBBING TRADE.

C. MOORE & CO.,
Manufacturers of
TWINES, THREADS AND YARNS,
Jacquard Harness Twines of all kind on hand and made to order.
S.W. Cor. Fifth and Market Sts., Phila.

Knitting and Weaving YARNS.
Cones, Cops, Warps, Skeins,
Single, Double, Three-Ply, etc.
Peeler, Egyptian, Mixed Colors.
Large Assortment.
EDWARD S. HYDE,
226 CHESTNUT STREET,
Philadelphia, Pa.

Of Two Evils, Choose Neither!

Don't use fluid oils, and oil your belts, your floors and your goods, as well as your bearings.
Don't use greases, which don't feed till the bearings grow warm, and leave a gummy residue behind, causing an increase of 25 or 30 per cent in the friction load.
Use **NON-FLUID OILS**, which don't drip like the corresponding fluid oils, nor inflate your coal bill like greases.
Our booklet tells why. May we not send it to you, with free samples to prove our claims? Better write to-day.

NEW YORK & NEW JERSEY LUBRICANT CO.,
17 Church St., New York City.

JOSEPH M. ADAMS CO.
WOOLEN YARNS,
Carpet Backing and Rug Yarns a Specialty.
ARCOLA MILLS,
Main St., foot of Centre St., Manayunk, Philadelphia.

Woolen and Merino Yarns,
1 to 10 Runs, at reasonable prices.
All Wool, Mohair and Wool Spun or Mixed Cotton and Shoddy Yarns, in white, gray, and colors.
Dress Goods Yarns a Specialty.
E. M. ROCKWELL, - - LEOMINSTER, MASS.

E. G. HARPER,
WORSTED and WOOLEN YARNS,
MERCERIZED COTTON,
395 BROADWAY, TEL. 1888 FRANKLIN NEW YORK.

YARNS Solis, Boston.
77
SUMMER STREET.
ANDREW J. SOLIS, Jr. & CO.

HOFFMAN, DeWITT & McDONOUGH,
Manufacturers of
Diamond Stay Bindings TRADE MARK
Tapes, Webbing and Bindings.
COTTMAN and G STS., PHILADELPHIA
Ryer's Station, P. & R. R. R.
Bell Telephone, 203 Cheltenham.

Wiscasset Mills Co. | Patterson Manfg. Co.
Efrid Manfg. Co. | Tuscorora Cotton Mill.
High Grade Hosiery Yarn
White and Colors. All Numbers.
Sewing Twine on Cones and Tubes.
SPECIALTIES IN WEAVING YARN.
Black and white. Double and twist for woolen trade.
CANNON MILLS, 55 Leonard Street, New York.

Woolen Yarn.

Spinners of woolen yarn working on commission are busy on contracts secured early in the season and these contracts will continue until next fall. The spinners of sale yarn have secured some good orders, but report that generally they are being held back. Said one spinner: "We are expecting large orders for yarn, but we have been disappointed so many times by postponed business that while we are sure manufacturers must have the yarn finally, we do not know just when the orders will be forthcoming."

On the other hand the yarn buyers in some cases state that they have advised their customers to hold off from placing orders as long as possible, as they think the new wool clip will see prices on domestic wool lower. For all that some good orders have been secured for fleece lined backing and the hosiery manufacturers have placed orders for merino yarn with some knitters working nights to fill orders.

Next season the cloth makers will require much woolen yarn to displace high priced worsted yarn, the yarn required being very smooth to imitate worsted yarn as much as possible, and some manufacturers are figuring for several thousand pounds. Some large orders for yarn spun from Australian lambs' wool are looked for later in the season. It is conceded that Australian lambs' wool is the cheapest wool on today's market and the yarn made from this wool will be a great feature in this present yarn season.

The woolen yarn spinners are also getting many orders for 2-ply yarn from sweater manufacturers and from glove and cap knitters. The season has started in slow for sale yarns, but the outlook is satisfactory. It is the opinion in all quarters that a good season is ahead of us.

Rag and Shoddy Market.

No marked change has taken place in the market for rags and shoddy during the last month. In some cases the manufacturers are urging a shipment of stock in advance of the contract date. Few new contracts have been made, this being due to the fact that the manufacturers covered their requirements earlier in the season. The strengthening of the cotton market has had a corresponding effect on cotton waste, which, however, has not sold in large volume. Prices have been well maintained. There has been a good demand for wool waste and the stock is low. The high price of wool has led many manufacturers to use their own waste to a greater extent than heretofore. This is a significant feature of the market and

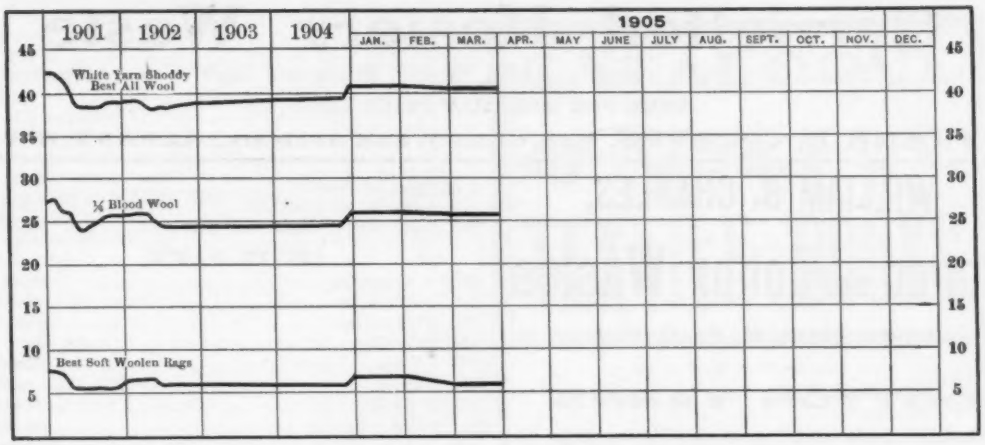

CHART SHOWING RANGE OF PRICES OF SHODDY, RAGS AND NOIL.

shows unquestionably that the continued high price of wool, which has no signs of weakening, will strengthen the market for all kinds of wool substitutes.

We quote as follows:—

SHODDIES AND EXTRACTS.

White yarn, best all wool	38-40
White knit, all wool, best, fine	28-32
White knit, No. 2	23-25
Light yarn, extra fine	25-28
New pure indigo blue	23-25

Merino.

Fine light, all wool, No. 1	24-25
Medium light, all wool, No. 1	16½-17½
Medium light, all wool, No. 2	14-16
Fine black, all wool	20-22
Fine dark, all wool, best grade	20-21
Medium dark, all wool, No. 1	13-15
Medium dark, all wool, No. 2	12-13
Red knit stock, strictly all wool	19-20
Red flannel, all wool	19-20
Dark blue for hosiery, strictly all wool, No. 1	17-20
Dark blue for hosiery, not all wool, No. 2	12-14

DELAINE EXTRACTS.

Light	19-22
Medium light	15-17

WOOLEN RAGS.

Regular gray	12-13
Black	14-15
Fancy colors	16-20
Fine merchant tailors, all colors	9-11
Choice light colors	13-15
Browns	12-13
Blacks	9½-10½
Fine blues, plain	9-11
Fine dark	10-11
Medium dark	7-8

Worsteds.

Blue	16-18
Black	18-20

Serges.

New black	15-16
New blue	14-15

Flannels.

New scarlet	18½-22
New blue	17-18
Cloakings	3-4

SOFTS AND KNIT STOCK.

Soft woolens, best	7-7½
Old white flannels	14-16
White flannels, No. 2	11-12
Old red flannels	9½-10
Light blue flannels	7½-9
Old blue flannels	6-7
Fine worsted, new black	26
New blue clip, best, fine	20-22
Dark mixed yarn, extra fine	22-24
All wool yarn, medium and coarse grades	15-20
Old plaids	5-7
White stockings	17-18
White hood stock	20-21
Clear hoods	9-10
Red stockings	9-10
Blue stockings	7-8
Fancy stockings, No. 1	7-9
Gray stockings	9-10
Black stockings	9-10
Knit stock comforters	6-7½
Red knit	9-10
Light gray knit	9-10
New light fancies	16-18
New fancies	12-14

Merinos.

Light, fine	13½-15
Light, coarse	7½-8
Fine, dark	12-13
Dark, No. 2	8-9
Coarse, dark	5-6
Blue	12-13
Blue—seamed	13-14
Black—unseamed	12-13
New black	18-20
Small	3¼-4
Bunting	6-8

FLOCKS.

Shear, fine white, all wool	9-11
Fine indigo blue, all wool	9-9½
Fine black, and blue, all wool	7-8
Fine dark, all wool	5-6

Garnetted Hosiery Waste

In Cotton, Cotton and Wool Mixes, and All Wool. White and Light Colors a Specialty.

SEND FOR MONTHLY PRICE LIST.

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COTTON YARNS.

Contracts made with Cotton and Woolen Mills for Yearly Waste Production. Correspondence solicited. Shepperson's Code, 1878. Cable Address "Charles."

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Springfield, Vt.

Carbonized Stock a Specialty.

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ED. GLUECK, Sec. and Gen. Mgr.

RIVERDALE WOOLEN CO., MANUFACTURERS OF

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Of every description. Capacity 7,000,000 pounds per annum
Custom Carbonizing and Garnetting a Specialty.

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You Save Enough Insurance to Pay for the Equipment.

So it costs you NOTHING to have the AMERICAN WATCHMAN'S CLOCK Fully approved by all insurance companies. We equip factories with Fire Alarms, Signals, etc., also Employee's Time Recorders, and Telephone Systems. Electric Time System consists of Master Regulator in office with secondary electric clocks throughout the mill, insuring accurate time Send for particulars.

Pettes & Randall Co., 150 Nassau St., New York

In Textile Mills

Warren's Pulley Cover

is the best and most economical belt slipping preventative. It is used by many of the best mills in the United States.

Any careful man can apply it.

Sufficient for 40 sq. ft., $5; 125 sq. ft., $12.
If your supply house does not sell it, order direct.

The Warren Co., Mfrs., 25 E. Chicago Ave., Chicago, Ill.

Gig, fine, all wool	3-4
No. 1 black, all wool cut	6-7
All wool, fancy, shear and gig	2½-3½

COTTON WASTE.

No. 1 Spinners	7½-8
No. 1 Machine	6-6½
No. 2 Machine	4½-5¼
Machine Cop	6½-7
No. 1 Cop	6¾-7¼
No. 1 Card	7-7½
No. 2 Card	6½-6¾
No. 1 Oily Card	4¼-4¾
No. 2 Oily Card	3-3½
Peeler Combing	7½-8
Egyptian Combing	Limited Quantity
No. 1 Linters	4-4½
No. 2 Linters	3½-4
White Clips	6¼-6¾
Colored Clips	5-5½
No. 1 Picker	2-3

Dyestuffs and Chemicals.

Acids.

Acetic, 100 lbs.	2.60-4.05
Citric, domestic	35-35½
Oxalic	4.95-5.00
Sulphuric, 60 deg., 100 lbs.	1.10-1.30
Muriatic, 18 deg.	1.50-1.60
Tartaric crystals	29-29¼

Miscellaneous Chemicals.

Acetate of lime, gray, 100 lbs.	2.30-2.35
Alum, lump	1.75-1.80
ground	1.85-1.95
powdered	3.00-3.25
Aqua ammonia, 16 deg.	3¾-4
Ammoniac, sal., gray	5¾-6
Borax, bbls.	7¾-8
Brimstone, crude, foreign ton	21.00-21.25
Copperas	52½-65
Cream tartar, crystals	23½-23¾
Fuller's earth, lump, 100 lbs.	80-85
powdered	80-85
Glauber's salt	25-45
Potash, chlorate, crystals	8¼-8¾
powdered	8⅜-9
carbonate	3.6-5
Soda ash, carbonate, 48 per cent.	1.25-1.50
high test	1.00-1.25
Soda, bicarbonate, English	3.50-6.00
American	1.30-1.70
Soda, caustic, domestic, 60 per cent.	1.85-1.90
Sal. English	67½-70
Sal. American	60-70
Sulphate, alumina	¾-1¼
Vitriol, blue	5.15-5¼

Dyestuffs.

Acetate of soda	3½-3¾
Acid, picric, best crystals	23-25
tannic, commercial	35-37

Albumen, egg	48-65
blood	21-26
Alizarine, red	15½-16
Aniline oil	10⅛-10½
salt crystals	8¾-9
Antimony salt, 65 per cent.	10¼-11
Bichloride of tin, 50 per cent.	9-9½
60 per cent.	12¼-12½
Bichromate of potash, American	8½-8¾
Bichromate of soda	6½-6¾
Bisulphate of soda	1½-2
Cutch, mat	4½-6
boxes	5-8
Dextrine, imported	6½-7½
corn	2½-3
Divi-divi ton	35.00-40.00
Flavine	23-40
Fustic, stick, ton	21.50-22
young root	31.00-35.00
Gambier	4¼-4¾
Hypo. of soda, Am. bbls. cwt.	1.50-1.60
Indigo, Bengal, low grade	52½-55
medium	60-65
high grade	75-85
Kurpah's, medium to good	47½-60
higher grade	65-75
Gautemala	35-70
Manila	43-45
Madras	42-45
J. (Synthetic)	18-20
Indigotine	95-1.80
Logwood, stick, ton	16.00-19.00
roots	14.00-16.00
Madder, Dutch	7-10
Muriate of tin, 36 degrees	9-9¼
52 degrees	15-15¼
Nitrate of iron, commercial	1¼-1½
Nutgalls, blue Aleppo	25
Persian berries	6-7
Phosphate of soda	2¼-3
Prussiate of potash, yellow	13½-13¾
Quercitron, ton	18.00-20.00
Starch, corn, pearl, bbls.	2.02
corn, pearl, bags	1.87
potato	3¾-4½
rice	6½-7½
wheat	5¼-6
Stannate of soda	12-20
Sumac, Sicily, No. 1, ton	44.00-47.00
Sicily, No. 2, ton	41.00-43.00
Virginia	37.00-38.00
Tapioca flour	1.95-2¼
Tin crystals	21½-23
Turmeric, Bengal	3-3¼
Zinc dust	5½-6

Extracts.

Fustic, solid	8-11
liquid, 51 degrees	6¼-8
Indigo	6-10
Logwood, solid	6-12
liquid, 51 degrees	5-10
Persian berry	9-15
Sumac	3-6

Virginia, Emporia. It is reported that Samuel Goodwyn, G. L. Vincent, W. N. Brown and others are interested in organizing a company with capital stock of $60,000 to build a mill for manufacturing cotton rope, heavy yarns and ball thread.

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WE have recently published a descriptive catalogue which contains a list of all books in the English language on textile subjects that are in print and that are of present value, classified under the different subjects to which they pertain. This catalogue should be in the possession of every mill man. It will be sent free upon application. New books on textile subjects are being published frequently. We can supply any textile or technical book, whether of our own publication or not, at lowest prices. We can also give information and prices of foreign textile publications, directories, etc. We are headquarters for everything in the line of textile literature and information.

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INGRAHAMVILLE DYE WORKS,

Dyers and Bleachers of Cotton Yarns in long or Short Chain Warps and Skein, in FAST COLORS, FOR BLEACHING PURPOSES, Cross Dyeing, Ginghams, Etc.

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Dyers and Finishers of Dress Goods, Men's Wear and Cloakings, such as Venetians, Armures, Soleils, Crepons, also Silk Warp Fabrics, Cotton Warp Linings, Suitings, Clays, Serges, Worsted Damasks, Tapestries and Shirtings.

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Fast Colors for the Woolen Trade. Capacity 20,000 lbs. per day.

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Bleachers and Dyers of COTTON YARNS and STOCKINET

Office with Blodgett & Orswell Co., Manufacturers of Glazed Yarns.

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of all grades of Cotton Yarn.

QUARANTEED FAST COLORS.

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Cleans Wool, Floors, Anything.

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MILL SOAPS

OF EVERY DESCRIPTION. ALSO LAUNDRY SOAPS.

ALL GOODS GUARANTEED.

The Best Lubricating and Softening Product

FOR WOOL, COTTON, WOOL AND COTTON MIXED

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EXCELSIOR WOOL OIL COMPOUND

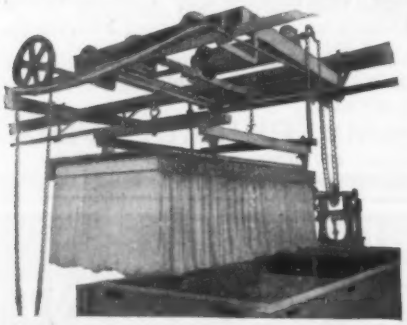
Absolutely free from Mineral Oils, Saponifies Perfectly, Odorless, Pure White and Stainless.] Washes out Perfectly and Easily. Great Economy Guaranteed in its Use. Write for samples, prices and full particulars

The EXCELSIOR WOOL OIL COMPOUND CO. - - - - CINCINNATI, OHIO.

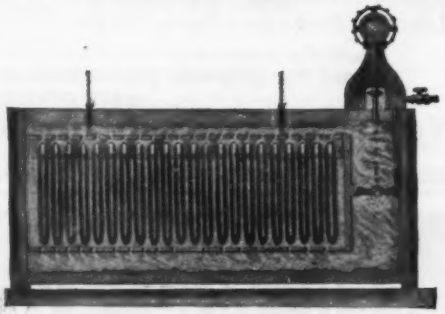
The Hussong Dyeing Machine

Patented Nov. 6, 1900. April 9, 1901. Nov. 29, 1904.

A PERFECT SKEIN DYEING MACHINE



This illustration shows our Compressed Air Hoisting Carriage, with 300-pound Yarn Machine suspended.



Longitudinal Sectional View, showing the circulation of dye-liquor through the yarn when in operation.

Points of Superiority Which We Claim for the Hussong Machine,

Durability, Even Dyeing, Saving of Steam, Saving of Dyestuff,
Saving of 75% in Labor, Makes No Waste Whatever, No Friction on the Material,
Requires but Little Power to Operate,
Leaves the Yarn and Slubbing in its Natural Condition.

Built by the **American Dyeing Machine Co.**, Office 609 Pearl St., **Camden, N. J.**

THE COHNEN
CENTRIFUGAL
Dyeing Machine

U. S. Patent 776,295, Nov. 29, 1904.

Dyes Raw Stock
or
Yarn in Cops, Skeins or Bundles (Warps)

DYES SULPHUR COLORS
without bronzing or streaking and leaves the stock in perfect condition for carding or weaving.

ONLY ONE HANDLING
is required to dye, oxidize and hydro extract ready for the drying room.

The Machine may be seen in operation by applying to the American Agents.

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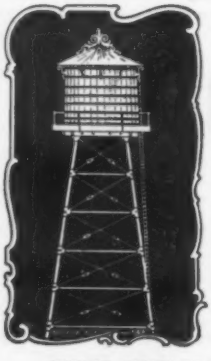

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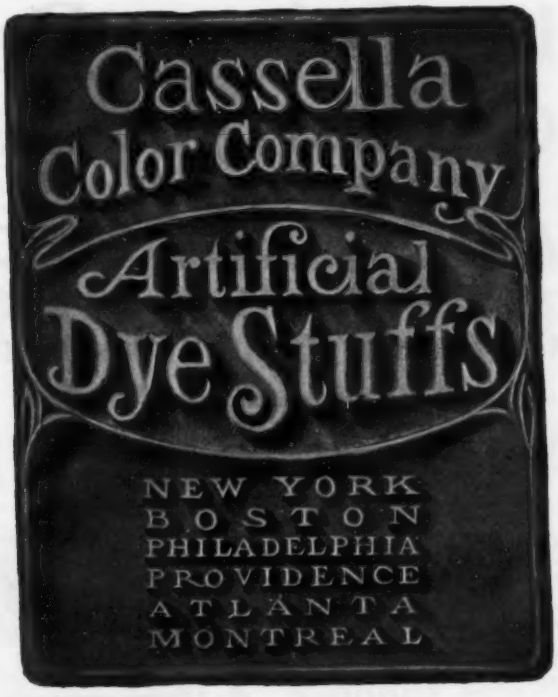
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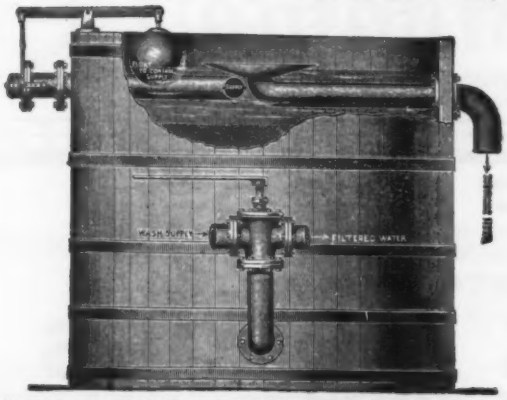

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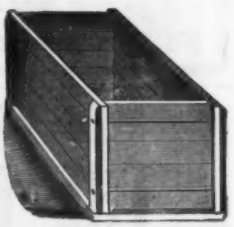

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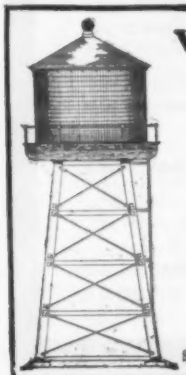

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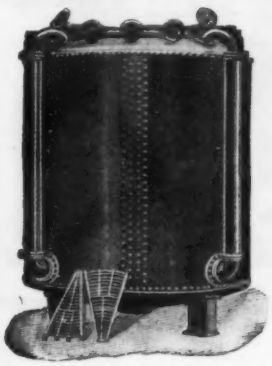

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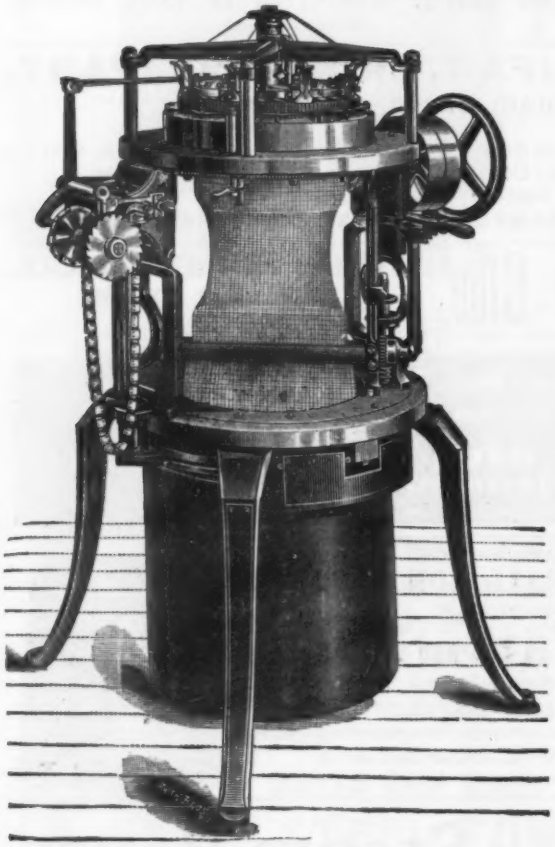

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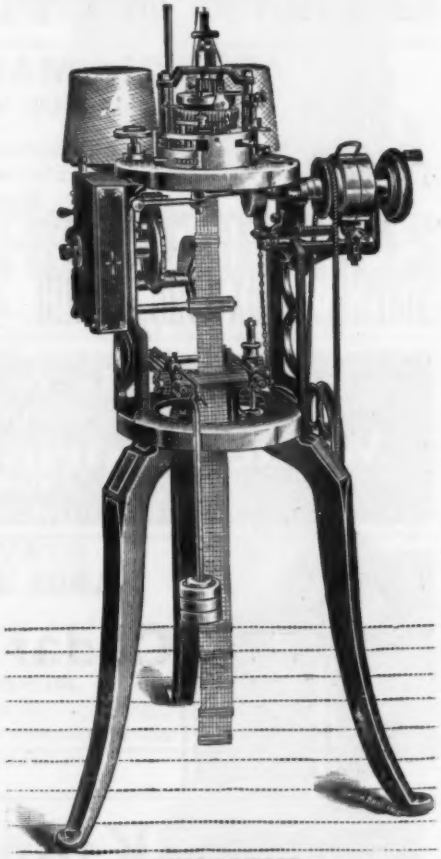

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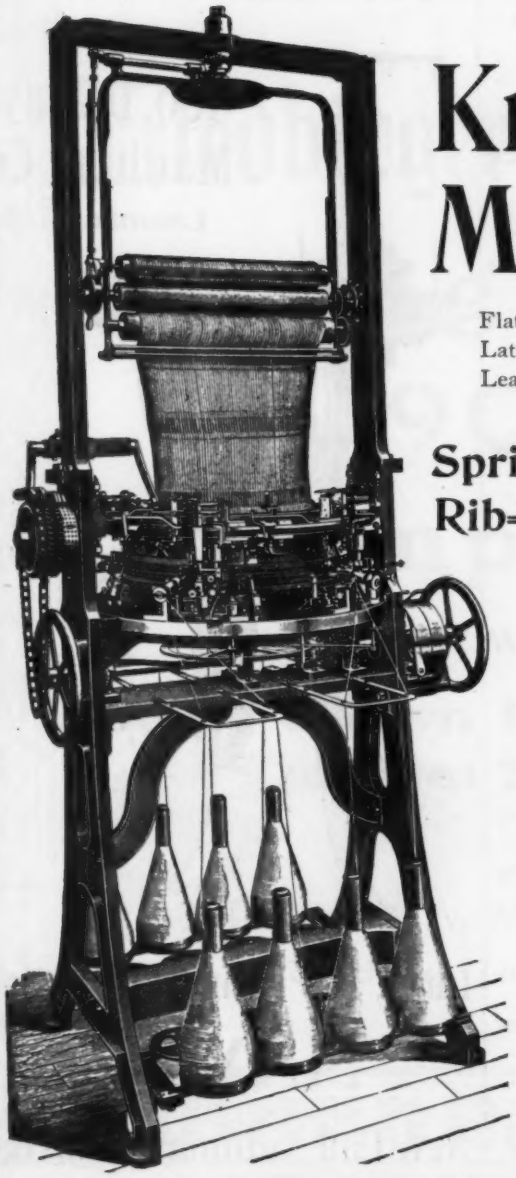

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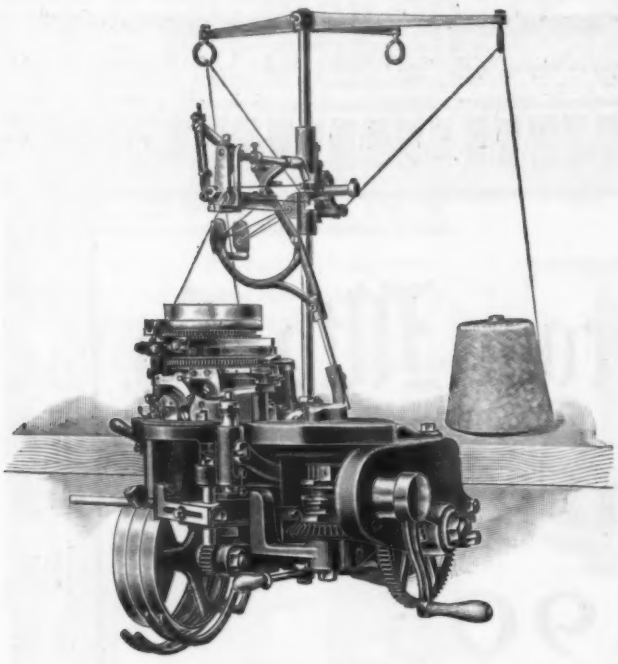

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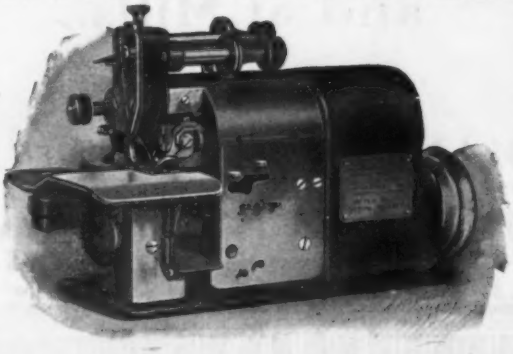

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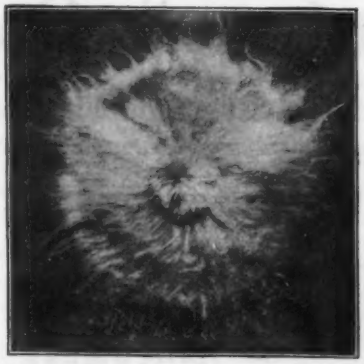

Tam O'Shanter Decision.

The United States Court of Appeals in Philadelphia, which is the Court of last resort, on Feb. 13th, 1905, decided in our favor, the suit against Morris Starrels of Philadelphia for infringement of our patent No. 669,011 dated Feb. 26th, 1901, for Flat Knit Caps or Tam O'Shanters and Art of making the same. The claims of our patent for making brushed knit tams, thus sustained are broad, and as a number of other manufacturers are also infringing, we have been compelled for our own protection to enter suits against them.

Our counsel will push these suits vigorously and are instructed to move for injunctions immediately to stop further infringements of our claims, which we have sustained after tedious and costly litigation.

All persons are, therefore, warned against the manufacture of these goods by methods which infringe the claims under our patent under penalty of immediate legal proceedings.

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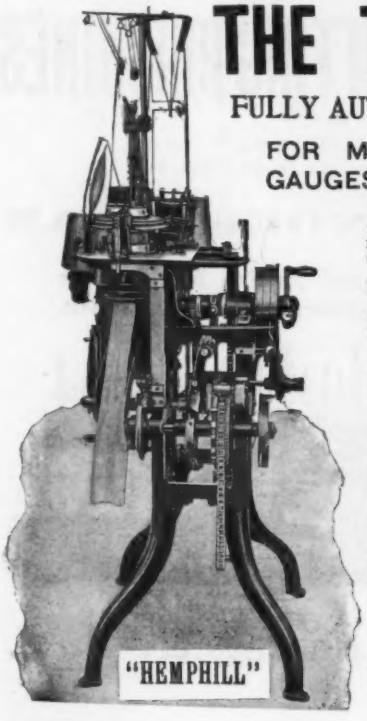

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Both contain all the well-known essentials demanded of first-class knitting machines.

With these two machines we can supply all manufacturers' possible wants in the best possible manner.

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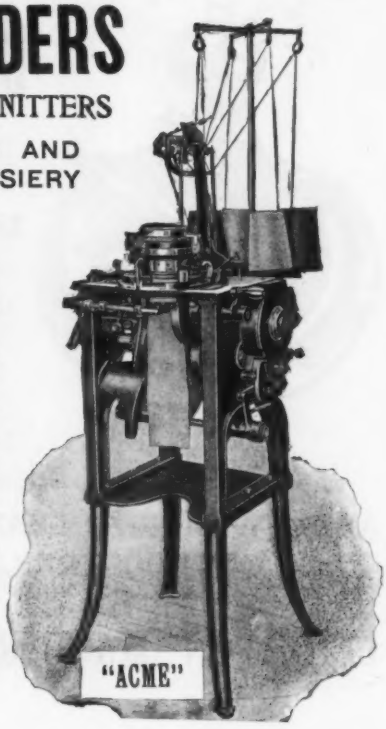

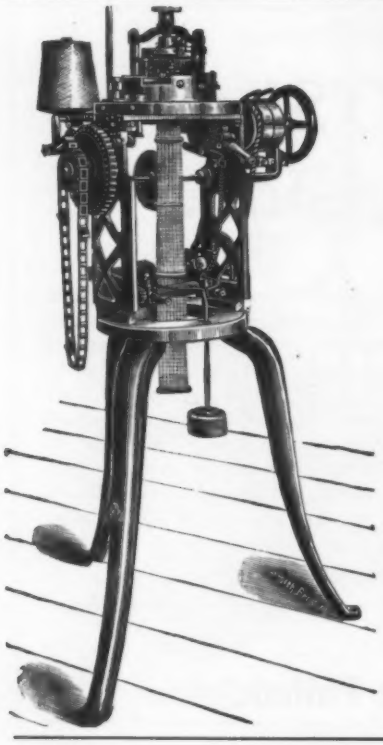

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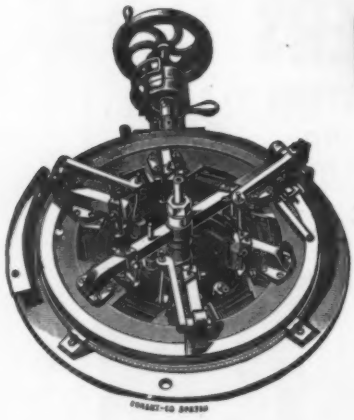

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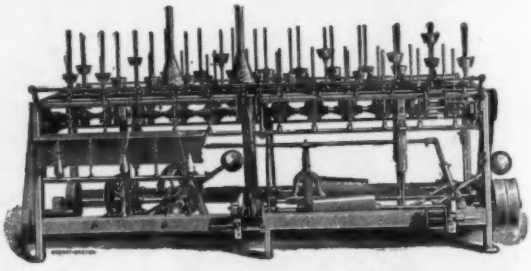

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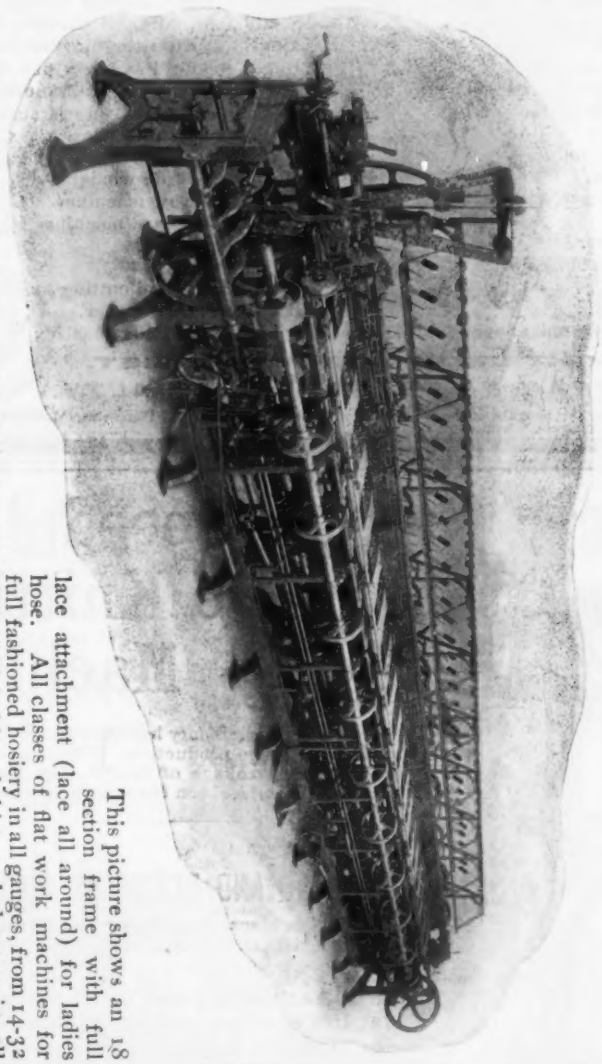

This picture shows an 18 section frame with full lace attachment (lace all around) for ladies hose. All classes of flat work machines for full fashioned hosiery in all gauges, from 14-32 needles to one inch, from 12 to 24 sections, also machines for full fashioned shirts and drawers in all gauges from 6 to 10 sections, with narrowing and widening. Split sole, plating, 2, 3 or 4 colors horizontal striping attachment, full lace and vertical striping machines.

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60 Brinton & Co. ¼ aut. knitters, sizes.
21 Standard A machines.
56 Union Special machines, various styles.
1 Rotary fire pump.
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100 Mayo machines. Various sizes.
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1 Smith & Drum singeing machines.
1 Small plant; 100 dozen per day, childrens' ribbed hose. Mayo footers.
1 36-inch engine driven extractor
1 10 plate Crawford press, 32 x 43.
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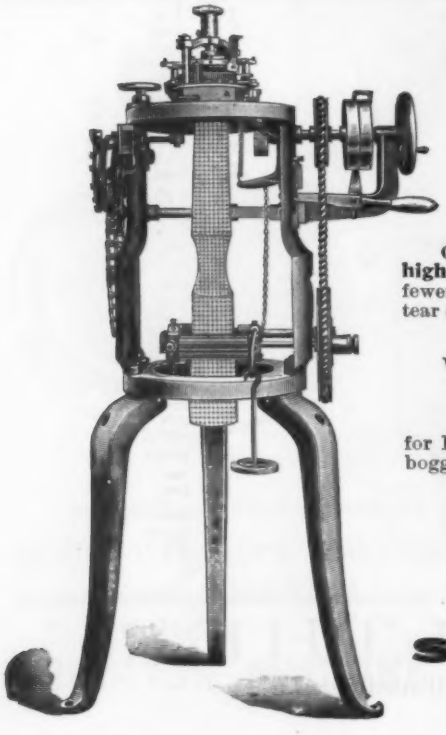

High Speed Rib Knitting Machinery.

Our latest model machinery has been designed to run at very high speed, giving large production. This is accomplished with fewer seconds, less breakage of needles, less jar and wear and tear on machines than has been customary at lower speeds.

We also make Special

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Our Machinery gives large production at low cost and enables manufacturers to meet the market always and make a profit.

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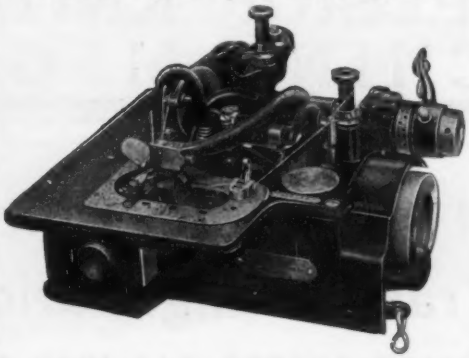
TRADE MARK. (Pat. April 5, 1892.)

Patent twice upheld by U. S. Court of Appeals.

For Trimming, Seaming (or Hemming or Overedging) and Covering Raw Edges of Knit Underwear and Hosiery in **ONE OPERATION,** and for making "Overlock" Corded Edge on Lace Curtains, Silks, Ribbons Etc.



Extract from Report of U. S. Consul at Nottingham, Eng.

"The Overlock stitching device of Willcox & Gibbs has had a phenomenal success since the date of its introduction * * * * The keen competition among manufacturers has necessitated its use, both as a matter of economy and to improve the character of output for a discriminating market."

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Business Est. 1859.

WILLCOX & GIBBS SEWING MACHINE COMPANY

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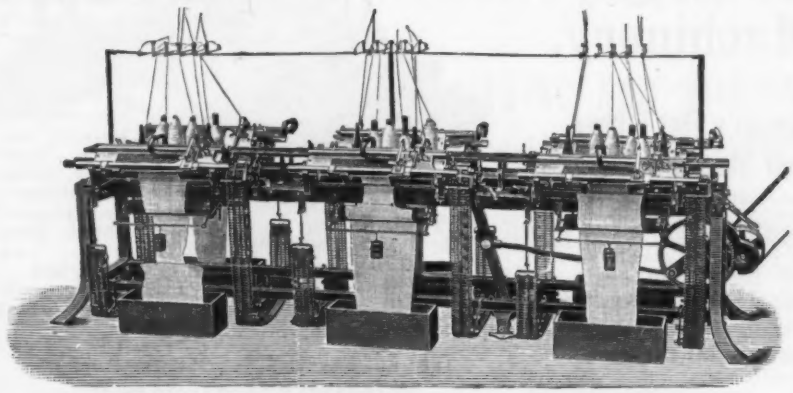
Branches: LONDON PARIS MILAN DRESDEN

The Grosser Knitting Machine Co.

Wool Exchange Room 400 — **MAX NYDEGGER** — 260 West Broadway New York

The ***"Grosser"*** full automatic Power Machines are always the ***cheapest,*** because ***they are the best.*** Special constructions for any kind of flat knit goods. Large Production. Machines easy to operate. The Grosser Jacquard and Shaker Machines have the best success in the market. Ask for descriptive Catalogue, Samples and particulars. ***Power Machines*** to ***be seen in Operation.*** Demonstration Rooms, Repair Shop. Largest and best assorted stock in ***Hand Knitting*** Machines, parts, needles and supplies. Promptest delivery. Special Machines for fancy gloves to be operated by girls.



"GROSSER" FULL AUTOMATIC WIDENING MACHINE, 6 SECTIONS.

Ask for prices and samples.

EXCELSIOR KNITTING MACHINE MFG. CO.

BUILDERS OF

Full Automatic Knitters

WITH OR WITHOUT

Transferring Device

ALL SIZES AND GAUGES, 2 1-4 INCH TO 4 INCH

MEADOW AND WASHINGTON STREETS ALLENTOWN, PA.

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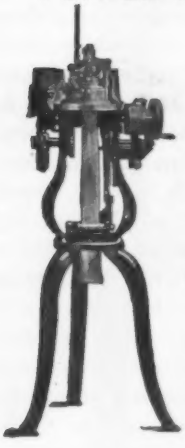
SUCCESSORS TO

PEPPER MACHINE WORKS

Lakeport, N. H.

Manufacturers of



Knitting Machinery,

INCLUDING

Pepper's Flat Ribbed Cuff Machines,

Automatic Welt and Loose Course Machines for Stock Tops. New Circular Stripers with Welt, Loose Course and Striping (Automatic), for Short Cuffs, Sock Tops, Hose Legs, Wristers, etc.

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ALL KINDS OF

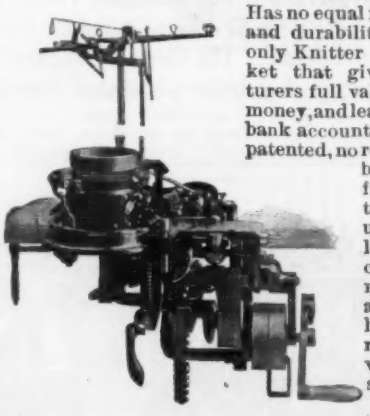
CIRCULAR RIBBED MACHINES

For Men's Underwear, Ladies' and Misses' Hose Legs and Leggins.

Correspondence Solicited.

The New Improved

Boss 15/16 Automatic KNITTER



Has no equal for simplicity and durability. It is the only Knitter on the market that gives manufacturers full value for their money, and leaves a swelled bank account. It is fully patented, no royalty to pay; built in sizes from 2½" up to 6"; from 42 up to 220 needles in 3¾" machine. Knits men's, ladies' and children's hose, plain or ribbed. Runs with one single belt. Automatic tension in heel and toe. Send for prices and particulars to

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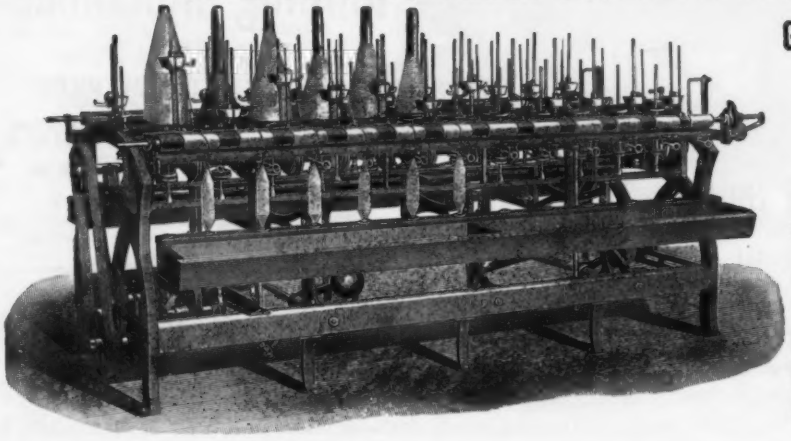
Cor. Elm and Reed Sts., Reading, Pa.

HARDENED STEEL CYLINDERS A SPECIALTY.

GEO. W. PAYNE, Prest. J. MILTON PAYNE, Treas. CLINTON F. PAYNE, Sec'y.

OVER 1,650 PAYNE WINDERS IN USE

For Hosiery Mfrs., Wind for Cop, Skein or Bobbin.



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Builders of the

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Upright Spoolers,

To Spool from Cop, Skein or Bobbin.

Doubling Spoolers, for doubling 2, 3, or more ends into one,

Upright Quillers, Quill from Cop, Skein or Bobbin.

Ring Dresser, Spooler and Reel Spindles, Cop Skewers, Warp, Spool, Spooler, Guides, Bolsters and Stops Made and Repaired at Short Notice.

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An Electric Stop Motion

Adaptable to all classes of

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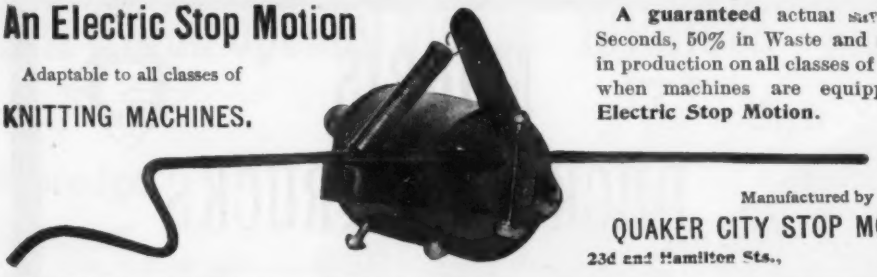

A guaranteed actual saving of 90% in Seconds, 50% in Waste and a 30% increase in production on all classes of Knitted Goods, when machines are equipped **with this Electric Stop Motion.**

Manufactured by

QUAKER CITY STOP MOTION CO.,

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SPECIAL MANUFACTURERS

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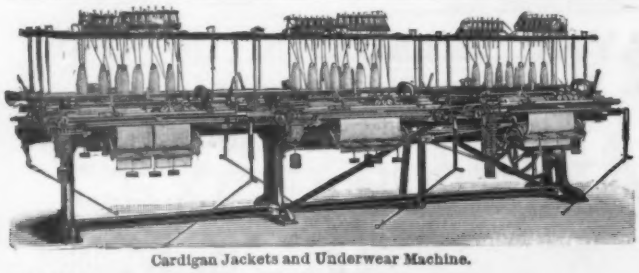
for hand and power driving, of best quality and perfect construction.

SPECIALTY: JACQUARD MACHINES

for hand and power driving for manufacturing of sweaters and every possible fancy article of that nature.

PRICE LISTS AND SAMPLE ON APPLICATION.



Cardigan Jackets and Underwear Machine.

AUTOMATIC

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For Plain and Fancy Goods.

THE BEST IN THE MARKET!

Special Constructions for different articles!

INDEPENDENT HEADS.

DOUBLE SYSTEM OF LOCKS.

Double-side Power Stands, 6 at once.

Paris, 1900, Gold Medal.

Ask for samples and particulars, state guage and size you want.

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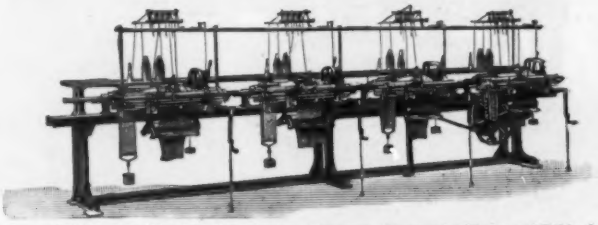
Representatives: Ainslie Knitting Machine Co., Ainslie & Humboldt Sts., Brooklyn, N. Y., where all kinds of hand and power machines can be seen working.



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DUCK MILL TRUCKS

The sides and bottom of this truck being flexible will not break spools or other articles thrown against them. Neither will there be any splinters, or a rough surface to catch cotton or tear yarn. Send for our price list No. 4.

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Manufacturers of

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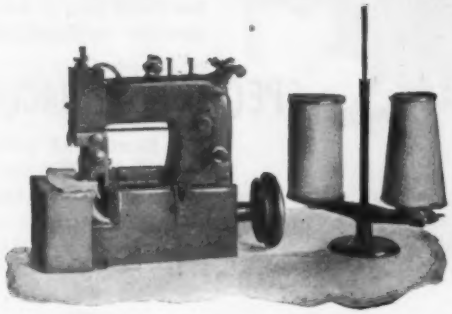

For All Kinds of

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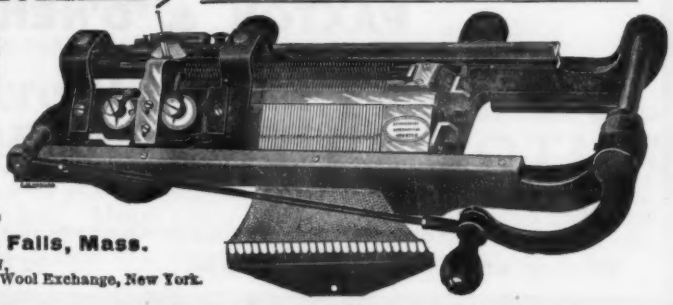
The LAMB, LEADER OF KNITTERS.

Original and Still the Best.

Most widely used; being operated in every civilized country in the world. For description, prices, etc., see catalogue.

CIRCULAR MACHINES,
RIB TOP and
SEAMING MACHINES.



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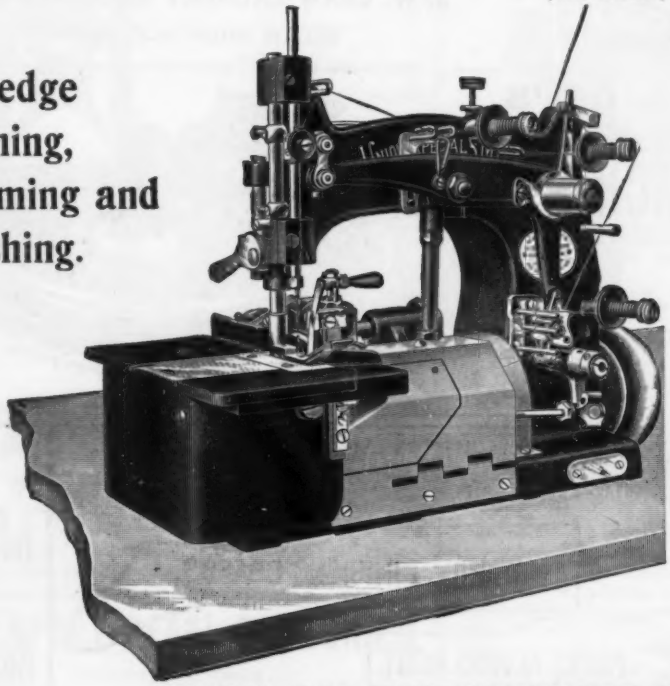
High Speed and Most Durable Mechanism are the Essential Elements of Machines to Produce Sewed Articles. We have these Elements in the

New Union Special Single "Interlock" Machine

(Trade Mark)

For Overedge Seaming, Hemming and Finishing.



High Speed Class 15400.

Two or Three Thread Stitch.

Simplicity.

Durability.

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FOR ALL KINDS AND GUAGES OF SEAMLESS HOSIERY.

Has the preference wherever used over 7-8 and full automatics. Because it makes as much or more goods and better goods. Costs less for repairs. Gives less trouble to fixers. Range on Half Hose, from the coarsest to 260 needle.

Exclusive rights to BROWN'S ATTACHMENTS FOR LACE EFFECT.

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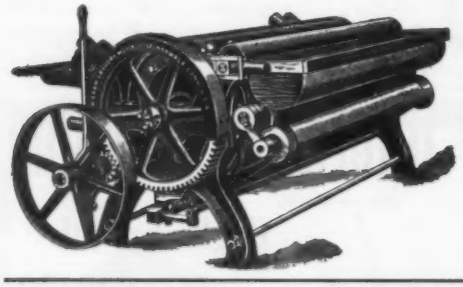

This machine irons and presses ribbed and flat underwear, giving a fine, smooth finish and most attractive appearance to the goods, not to be obtained in any other way. It does not break buttons. Inexpensive and easy to operate, and has large capacity. Knitting mills using them are greatly pleased with results. This method of finishing is sure to come into universal use. Send for further particulars to

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Patent Single-Stitch

LOOPING MACHINE.

Needle working from the inside, avoiding the breaking of needles and points and picking up the metal.

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BEST WORK. PROMPT SERVICE. PRICES ALWAYS RIGHT.

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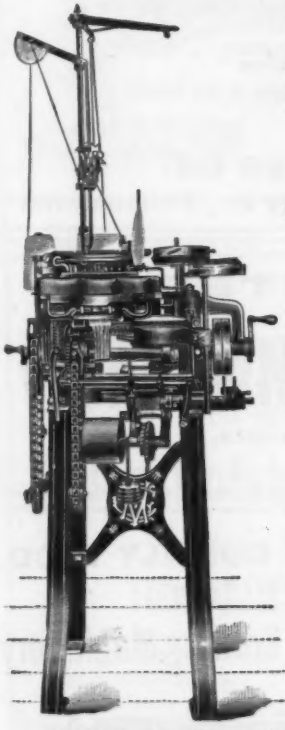
Hosiery Boards.

We Know How

TO BUILD HOSIERY MACHINERY

That's Why There Are More Standards



in use than any other make.

Have you seen the new Standard F?

It will produce from **30%** to **50%** more goods than any other machine on the market.

Hosiery manufacturers are invited to inspect it in our show rooms.

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KNITTING MACHINE.

For Hosiery, Shirts, Drawers, Jersey Cloth and Stockinet
A Specialty of Hardened Bladed Burr Wheels with Self-Oiling Brackets

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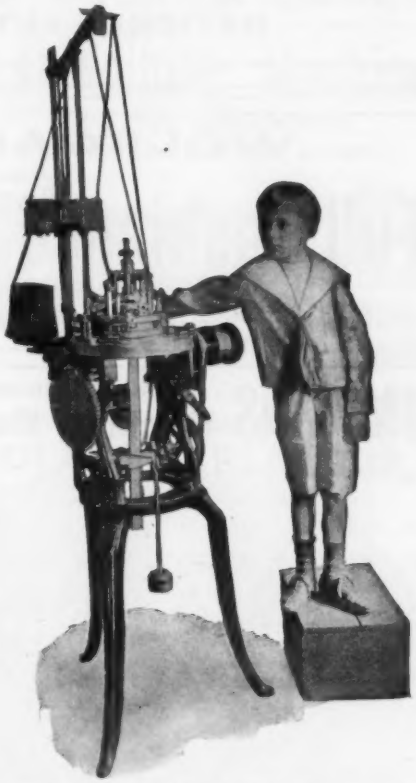
A FAIR PROPOSITION

If wanting to purchase Ribbers, you can try a

RUTH RIBBER and STOP MOTION

before buying to satisfy yourself that they are all right. Our STOP MOTION is a decided improvement over all others. No cutting of yarn, easy to thread. Stops from any imperfection in yarn. The movement of one lever releases brake and corrects yarn guide, when stop is caused by knot you have but one hook to thread. Very positive in its action.



Our RIBBER is high speed, durable, simple and easy to operate, with largest production; single or double feed, plain or fancy stitch for half hose and misses goods. Large loose-course, good round welt, double knee, sleeves or cuffs. Knits wool or cotton yarn, fine or course guage. Hardened cylinders and dials for any make of machine. Best Workmanship. All products guaranteed. Can attach STOP MOTION to any style machine.

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For SEAMLESS HOSIERY, Plain and Novelties

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For RIBBED UNDERWEAR. All Styles and Gauges

Over Seam Machine "Champion Improved"
For Welting Seamless Hosiery. Covering Raw Edges of Rib Fabrics.

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LATEST IMPROVED
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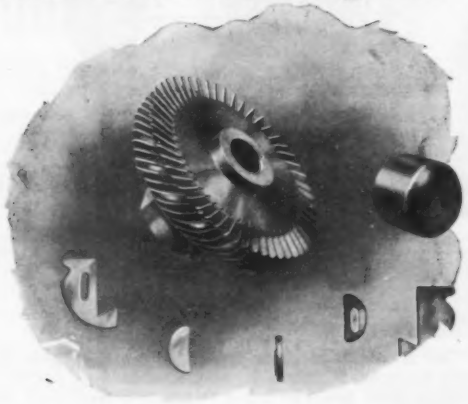

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BUILDERS OF
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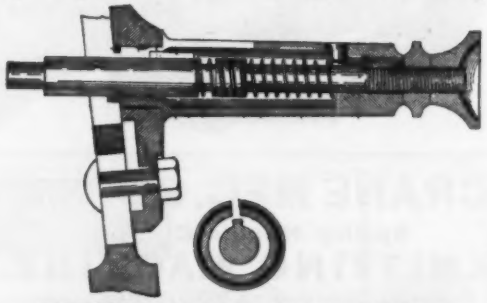

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Drying Form Boards
OF EVERY VARIETY.

For Ladies', Gents', and Children's Goods.
LATEST STYLES.
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Two Cutters Saved

For every three employed. In other words, the

Eastman ELECTRIC Cloth Cutter

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We also have papers to duplicate those on imported boxes.

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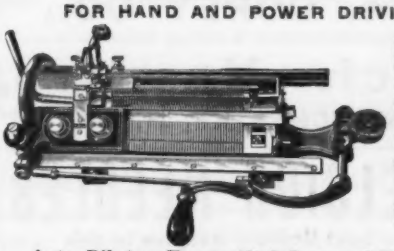
Best Knitting Machines

IMPROVED CONSTRUCTION
FOR HAND AND POWER DRIVING.



High Speed, Excellent Workmanship.

Auto. Rib-top, Fancy-stitch Jacquard Machines.
Everywhere in work. **80,000** Machines sold.

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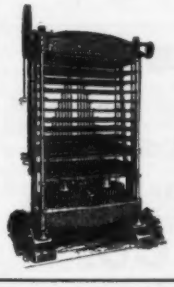

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The most reliable machine of the kind on the market.

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Fine Specialties for Fancy Knitting Trade.

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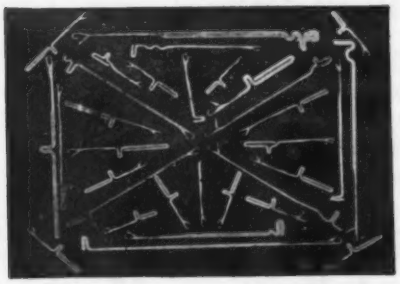
TRY OUR "SUPERIOR" OR SUNKEN RIVET-HEAD NEEDLES

They will save you money.



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Latch Needles,
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Manufacturers of all kinds of
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of all kinds. Warranted in every respect.
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Our Knit Fabric Cutter
will cut from the roll, knit fabric into any length from 10″ to 40″ at the rate of 100 pieces a minute. The lengths are accurate, the waste is a minimum, the labor unskilled.
We also make a Slitter
for cutting these goods into narrow strips and rewinding same into rolls.
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MECHANICAL HEATING VENTILATING & DRYING MECHANICAL DRAFT FANS.
MASSACHUSETTS FAN COMPANY,
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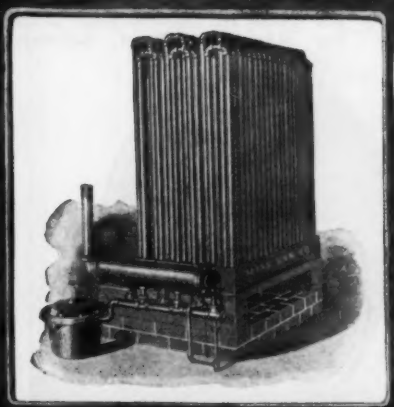

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For Underwear, Overshirts and Sweaters,
JOHN CATHCART & CO.,
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A. McMICHAEL,
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Repairs to Hosiery and Underwear Machines,
Cylinders and Dials of every description.
FINE MACHINE WORK.
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We HARDEN all CYLINDERS and DIALS large and small.

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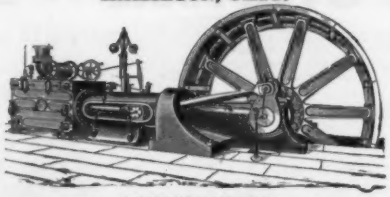

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Simple, Compound and Condensing, of any size, for all purposes.
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OF THE
United States and Canada.
Compiled by TEXTILE WORLD RECORD.
(Twenty-third year of publication.)

This Directory contains a most complete report of the knitting mills, giving names of officers, class of goods made, number of knitting machines, number employed, how the goods are sold, names of buyers, kind of yarn bought, whether dye or finish.
In dry goods section is a full list of manufacturers' selling agents and commission merchants handling knit goods, giving the names of the mills for which they sell and the man in charge of the knit goods department.
There are also complete lists of jobbers, department stores and large retail estalishments buying knit goods
The book is of convenient size for the pocket, well printed and handsomely bound.

Price $1.00.

LORD & NAGLE COMPANY, 299 Devonshire St., Boston
123 Liberty St., New York.
425 Walnut St., Philadelphia.

Boston Wool Exhausters, with Removable Tops.

As used in Connection with Pneumatic Conveyor System for Handling Wool, Cotton, Rags, Excelsior, Jute, etc.

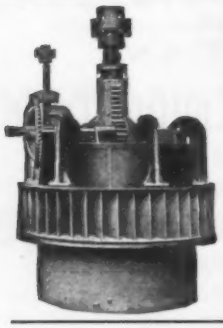
Inlet Side of Right-hand Wool Exhauster.

Pulley Side of Left-hand Wool Exhauster.

This machine is similar in design to the regular Boston Patent Exhaust Fan, but is fitted with a special wheel for handling fibrous materials, and the top is removable.

This latter feature is especially desirable when handling wet or greasy materials or in handling anything, in fact, which would leave a deposit on the inside of fan, as the entire top may readily be removed for inspection or cleaning without disconnecting either pipe or belt connections.

BOSTON BLOWER CO., Main Office and Works: **Business and Glenwood Sts., HYDE PARK, MASS.**



Risdon=Alcott Turbine Co.

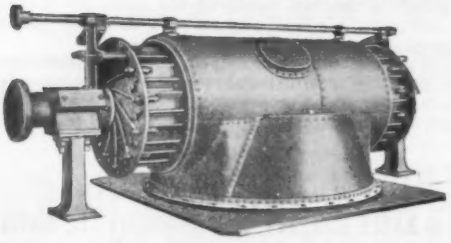
MOUNT HOLLY, NEW JERSEY, U. S. A.

RISDON CELEBRATED TURBINE
ALCOTT HIGH DUTY TURBINE

On Horizontal or Vertical Shafts.

These Turbines are recognized as the most effective water wheels made. Your inquiries should come direct to us for this class of machinery.

SAMSON TURBINE



AN EVEN and REGULAR SPEED under all CHANGES of LOAD is always desirable. This condition combined with a QUICK SPEED and HIGH EFFICIENCY makes a combination hard to beat. The SAMSON maintains all these conditions under the most severe tests.

Write Department A-5 for Catalogue.

The James Leffel & Co., SPRINGFIELD, OHIO, U. S. A.

CHARLES H. SCHNITZLER,
Patentee and Sole Manufacturer of
THE PNEUMATIC CONVEYOR

For the handling of wool and cotton stock, rags, excelsior, jute and all kinds of fibrous material, wet or dry. Also spool elevators, steam heating and ventilating, and mill work generally. Blower and fan work a specialty. This conveyor is patented. Beware of infringement.

SATISFACTION GUARANTEED. Patented Oct. 15, 1889.

215 NORTH SECOND ST., - PHILADELPHIA, PA.

G. Bickelhaupt Skylight Works

Sole Manufacturers of
G. B. TRADE MARK SPECIALTIES.

SELF-LOCKING SCUTTLE OPENER.

Skylight Lift and Skylights.

Established 1869. Send for pamphlets.

243-245 N. 47th Street, - NEW YORK.

Water Wheel Governors

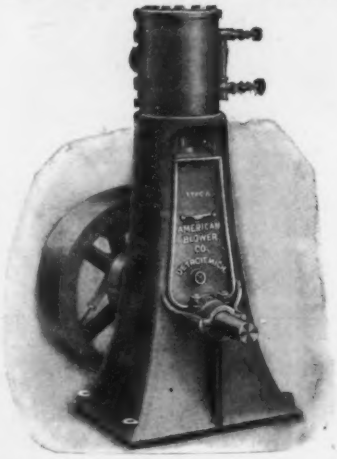
For TEXTILE MILLS

We Guarantee Satisfaction.

Replogle Governor Works

Write for Catalogue T. **AKRON, OHIO.**

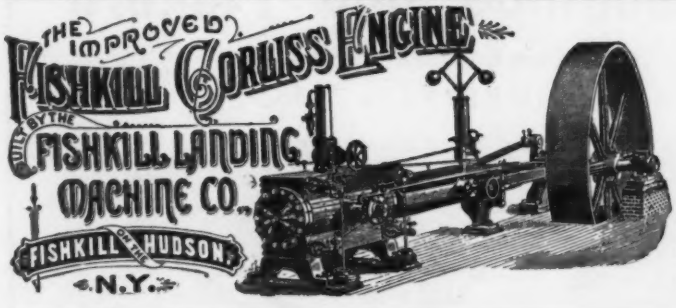
SELF-OILING ENGINE



Especially adapted for continuous operation at high speeds—every working part runs in oil—no contact between metals—fully enclosed.

FANS AND BLOWERS FOR ALL PURPOSES.

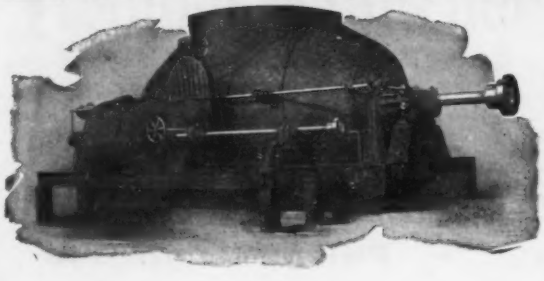
AMERICAN BLOWER CO., Detroit, Mich.



Most Efficient and Economical Power in the world For Textile Mills.

It has NO EQUAL for Close Regulation and Noiseless Operation. Send for Catalogue.

PAIR McCORMICK TURBINES

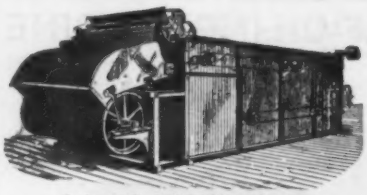


4,000 H. P., 72 ft. head, arranged to drive generator and a single turbine to drive exciter. Five settings built for the Hudson River Water Power Company's Spier Falls plant and 14 pairs 51 inch for their plant at Mechanicsville, N, Y.

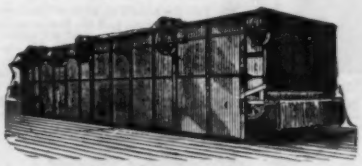
Write for Catalogue if contemplating purchase of turbines.

S. MORGAN SMITH CO.
YORK, PA.
Boston Office, 176 Federal Street.

APR 13 1905



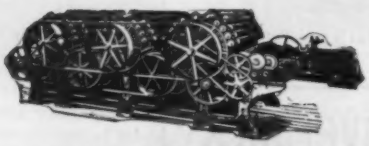
Automatic Cotton Stock Dryer.



Automatic Yarn Dryer.

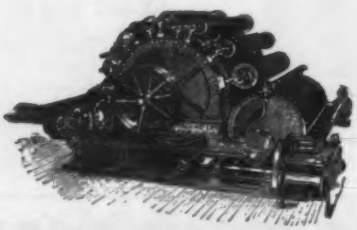
"CYCLONE" DRYERS

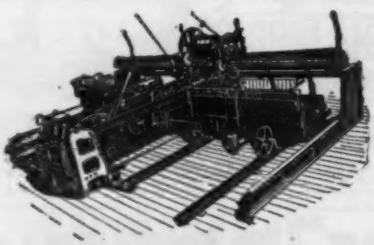
For Cotton Stock, Wool Stock, Rags,
Yarn, Cloth, Underwear, Stockings, Etc.



"PROCTOR"
Garnett Machines and Pickers

For reducing to fibre Cotton and Woolen
Waste, Cloth Clippings, Etc.





"FURBUSH" Woolen Mill Machinery

Including Pickers, Cards, Mules, Twisters,
Warpers, Dressers, Spoolers, Etc.

Manufactured by

THE PHILADELPHIA TEXTILE MACHINERY CO.,

Hancock and Somerset Sts., - PHILADELPHIA, PA.

"I did it with Jap-a-Lac"

Every Reader of this Magazine should buy a copy of the May issue of

THE DELINEATOR, *or*
THE DESIGNER, *or the*
NEW IDEA WOMAN'S MAGAZINE

and read our four-page advertisement, which appears in the front, because it illustrates in their actual colors the many principal ways that **JAP-A-LAC** can be applied by anyone to beautify their homes at little cost, so that *they can say* "I did it with **JAP-A-LAC**."

Knowledge of all the uses of **JAP-A-LAC** will make it to your interest to buy one of these magazines. You will then realize that with **JAP-A-LAC** you can make many things in your house, besides the worn or defaced wood, *look like new* at a nominal cost, because it does what furniture dealers have been charging high prices for when they apply it for you.

For these reasons, and because years of experience in advertising in all classes of magazines have proved THE DELINEATOR, THE DESIGNER and the NEW IDEA WOMAN'S MAGAZINE to be the most profitable, we selected them to place this advertisement, costing

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the largest sum of money ever paid by any advertiser for any advertisement prepared and printed by any magazine

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THE NEW FOSTER WINDER

OPEN WIND from start to finish of cone.
No press-offs from knots, no flattening of yarn.
The only perfect system of winding yarn.
for knitting purposes.

TUBE WINDERS, SKEIN WINDERS, DOUBLERS.

FOSTER MACHINE COMPANY,
WESTFIELD, MASS.

Buffalo Fan System

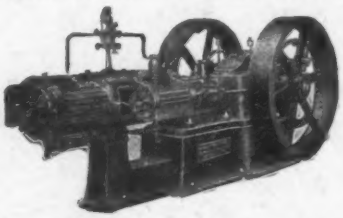
OF HEATING, VENTILATING, DRYING AND HUMIDITY CONTROL.
Used by America's Foremost Textile Mills.

Economical – Efficient – Reliable.

Buffalo Engines

FOR ELECTRIC LIGHT AND POWER SERVICE.

High Speed

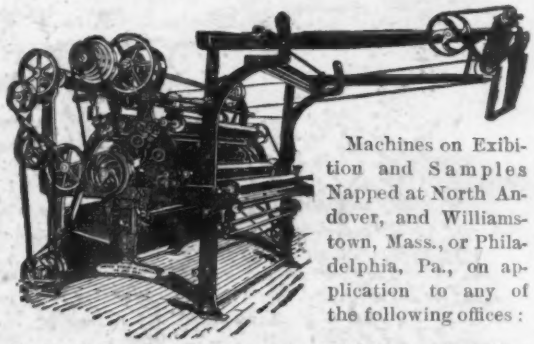


High Grade

Buffalo Forge Co., Buffalo, N.Y.

THE AMERICAN NAPPING MACHINE CO.

Own the principal patents on Napping Machines, representing the latest French, English and American Patents.



Machines on Exibition and Samples Napped at North Andover, and Williamstown, Mass., or Philadelphia, Pa., on application to any of the following offices:

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C. J. Jones, Salesman, No. 160 West Lehigh Avenue, Philadelphia, Pa.

H. H. HEAP, Treasurer and General Manager.
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VALVES AND FITTINGS

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